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Technic of Making a Colostomy

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In planning a colostomy it is essential that the stoma be placed in healthy bowel above the disease and therefore it may be located on the left side, the central abdomen or even on the right side. The lowest colonic loop feasible is selected because the feces are thus more solid than higher up and involuntary evacuations occur less often. There are times, however, when the transverse colon, the ascending colon or even the cecum must be used. Whatever portion of the gut is used there must be free exit of the feces as well as a blocking of its progress into the bowel below, and the stoma is to be so placed that it will not interfere with the re-establishment of the normal fecal current later when that may be desired. In nearly all cases the sigmoid flexure is used and our first description is of the sigmoidostomy.

Sigmoidostomy

Landmarks—Umbilicus; body of the left rectus muscle; left anterior superior iliac spine; Pouparts ligament; and the symphysis pubes.

Through a left rectus incision all portions of the rectum and sigmoid are conveniently reached, subsequent dressings are easily adjusted and the patient can easily care for himself.

The incision must be extensive enough to permit a thorough survey of the involved region, but not more because there is always a possibility of a subsequent hernia. There is much less danger of this complication with the intramuscular operation than with the transmuscular methods.

The surgeon stands on the patient's right side and cuts from above downward. He steadies and renders tense the abdominal wall with his left thumb and middle finger an opens the abdomen through a 4 inch incision, beginning one inch below and one inch to the left of the umbilicus and extending downward toward the pubes. The incision should afford room for expeditious and untrammelled working. It is made the full length of the predetermined distance at one clean sweep of the knife; passing through the skin and connective tissue. In very fat subjects the skin and thick fatty areolar tissue may be divided by two or three successive sweeps of the knife. In passing through the several layers of the abdominal wall all incisions should be made the full length of the original skin incision. The muscle and fascia fibers are carefully split by blunt dissection with the fingers, handle of the knife or blunt scissors, and not cut across, thus preserving intact its blood and nerve supply and its function. All bleeding in the planes of the wound are clamped and tied with number one catgut before the peritoneum is opened.

Important factors in the production of shock are the amount of blood lost at the time of operation, the degree of handling of tissues, and the amount of ether consumed by the patient. Hemorrhage should be absolutely controlled at the time of operation so that the loss of blood may be reduced to a minimum. Five yard rolls, laparotomy pads, etc., should be omitted whenever possible.

In making the abdominal section the several structures should be recognized as reached. The aponeurosis of the external oblique blends with the outer sheath of the rectus muscle. Branches of the superior epigastric artery perforate and supply the rectus muscle and will require ligature. The inner layer of the rectal sheath is formed by the aponeurosis of the transversalis and

inner lamella of the internal oblique muscle. The pyramidalis muscle will probably be severed at the lower angle of the wound. The preperitoneal areolar tissue lies between the transversalis fascia and the peritoneum, and is generally divided together with the deep fascia. It may be quite thick in very fat subjects. As the peritoneum comes into view it is recognized by its glistening, bluish arborescent and tough surface. These characteristics may be lost, however, in the presence of inflammatory changes and adhesions.

Isolating the peritoneum from all underlying structures, especially the intestines, it is picked up lightly with two pairs of toothed forceps which are shifted laterally and vertically to determine that nothing but peritoneum is grasped. Should intestine, omentum or other structures be grasped, our hold is immediately released and a lighter (smaller) bite is taken. While thus held by the surgeon and his assistant, a carefully guarded nick with the knife between the forceps opens the abdomen. The omentum and intestines are usually close against the peritoneum which must therefore be lifted up and opened cautiously to avoid injuring the underlying structures. Through the opening in the peritoneum one limb of a blunt pointed, straight bladed scissors is introduced and the incision enlarged by cutting in the line of the incision. The left index and middle fingers are then introduced and turned palmer surfaces up to act as a guide to lift the abdominal wall, and at the same time to push back the abdominal contents while the peritoneal opening is enlarged the full length of the rest of the incision. All levels of the abdominal wall must be incised the full length of the skin incision to avoid a funnel shaped wound.

The abdominal wall is now lifted up and the inrushing air will cause any coils of intestine, which have not gravitated out of the pelvis, to slide upward; so that it is usually necessary to employ only one small gauze square to get excellent exposure.

If a loop of small intestine, the omentum or mesentery present during the operation they are pushed back into the abdomen. As soon as the abdomen is opened provision should be made to guard against the gushing out of the intestines, which is apt to take place if there is much distention. The parietal peritoneum is picked up and tacked to the skin at several points. This prevents the peritoneum from retracting or from fraying or stripping.

If the incision is carried to within 5 cm. (2 inches) of the bladder that viscus must be held away from the line of incision by the fingers of the left hand because, although empty, if adherent unusually high it may be wounded. The abdominal incision should be as short as is consistent and thus preserve the function of the muscles. But it is sometimes necessary that the abdominal opening be made large enough to permit the introduction of the hand to carefully explore the pelvic and abdominal cavities, the upper and lower surfaces of the liver and the pelvic lymphatics.

This examination should be carried out systematically and not by random and it may be done expeditiously. If doubt exists as to where the obstrucion may be found, the cecum having a fixed point may first be sought. If it be distended the obstruction is somewhere in the large intestine, and it should be systematically examined. If the cecum be collapsed, the obstruction is in the small intestine. As the obstructed coil is usually found in the pelvis, whether it be of the small or large intestine, it is well to begin the search in the pelvis. Owing to the fact that the large intestine is sometimes distended distally to the obstruction, a colostomy has been performed on the wrong side of, distal to, the blockage.

In this examination the collapsed portion of the bowel below the obstruction is located and the best location for the colostomy determined.

If the descending colon or sigmoid cannot be located, it may be recognized by having a nurse inject water through the anus, if there is no obstruction below, and the surgeon's finger within the wound will note the distending sigmoid. With the hand well down in the pelvis, one may locate the rectum, and, passing upward, secure the lower loop of the sigmoid and drag it out of the wound, at the same time definitely knowing which is the upper and which is the lower portion. The sigmoid and colon are further recognized by the longitudinal muscular striae, the appendices eiploicae and the sacculated form of the gut. The transverse colon may be mistaken for the sigmoid if the former is much prolapsed. The operator must be quite positive about this relationship and position, as otherwise, if there be a long slack mesocolon the portion of the bowel brought out and opened may be twisted upon itself, and complications may occur later because of this. Should any difficulty be experienced in locating the sigmoid, the surgeon will pass two fingers into the wound, then follow the abdominal peritoneum outward toward the left iliac fossa, then turn the hand and follow the parietal peritoneum inward over the pelvic floor towards the middle line until the finger is arrested by the only fixed portion of the bowel in this region, the iliac colon, and this can be traced over the brim of the pelvis to the sigmoid colon which is then drawn upward and outward into the wound. It is recognized by the longitudinal band of white fibers (the teniae) and by the appendices epiploicae. In this maneuver the entire peritoneal surface is traced and the first portion of visceral peritoneum reached will be the mesosigmoid. As soon as the fingers leave the parietal peritoneum for the visceral peritoneum that piece of bowel is caught between the two fingers and delivered through the wound and is the sigmoid.

The sigmoid being located, the length of its mesentery is determined. The mid portion of the loop of the sigmoid flexure is usually the most suitable because of its extreme mobility and the great length of its mesentery (3 to 6 inches). Occasionally the mesentery is very short or absent or adhesions involve the sigmoid, it may be difficult to bring the bowel far enough forward to employ the desired technic with success. In such cases the bowel must be mobilized before it can be used in the colostomy. If it cannot be sufficiently freed by cutting the outer leaf of the mesentery, the relatively non-vascular aspect of the mesentery, then the mesentery may have to be divided on its inner aspect. In such case the corresponding mesenteric vessels will have to be ligated. This, however, is not a serious matter if we are careful to ligate only those vessels supplying that part of the bowel that is to be drawn out above the skin and which is later to be excised. This portion of the bowel even if it does slough will be cut away. Usually the mesentery is long enough that the loop of the sigmoid may be lifted out beyond the skin level until it is taut and a bloodless portion of its mesentery may be selected.

Mortality Rate Declines in Large Cities of Nation

The 1927 mortality rate for 67 large cities of the United States, as indicated in the last weekly health index for 1927, just issued by the Department of Commerce, was 12.3 per 1,000 of population, as against 13.1 for 1926.

Tobacco and Its Abuses

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That the abuse of tobacco may lead to harmful effects on the body, is conceded by practically all medical writers. However, it is common knowledge that many persons smoke freely all their lives without appearing to suffer thereby. It is therefore difficult to set the dividing line between what constitutes moderate and therefore harmless smoking and excessive or injurious smoking. And the susceptibility of different individuals to nicotine varies so greatly that it is impossible to formulate any hard and fast rule.

The success of modern advertising in recruiting the ranks of smokers from the young and impressionable generation is an occasion for great concern. A study of the situation in the Netherlands has shown that the abuse of tobacco by children has grown to an alarming extent. An extensive inquiry in that country proved that 30 per cent of boys only six years old, 50 per cent of those aged from nine to ten, and 88 per cent over eleven have already become smokers.

Toxicity of Nicotine

The toxic action of nicotine is unquestioned. Osler,[1] in his classification of the causes of irregular heart action, cites toxic influences and places nicotine at the top of the list. He gives tobacco, cocee and tea as the trio constituting the common causes of circulatory irregularities.

I vividly recall my first laboratory experiment with the use of nicotine on the frog's heart. After a few drops of nicotine solution were brushed on the organ, there was a brief diastolic standstill, due to stimulation of the vagus nerve; then the heart's action was increased and finally depressed. Nicotine, it is known, first stimulates and then depresses both the vagi nerves and the sympathetic ganglia of the heart. From these early observations I soon learned to regard nicotine as a drug possessing all the characteristics of toxicity.

Dr. I. Adler in 1902 reported his memorable observations on the effect of tobacco on the tissues of rabbits. The animals, which were allowed to roam freely in box-stalls, were fed upon fresh cabbage. Once a day each rabbit received a sufficient quantity of finely chopped cabbage, which, however, was carefully mixed with an infusion of tobacco. At first the animals were nauseated; later they became active again and regained their appetites. After a few days, their appearance and behavior seemed normal.

When the tobacco-fed rabbits were autopsied, however, there were definite evidences of toxic effects. From his findings, Adler inferred that tobacco is a "toxic substance, probably one of many, which, acting with extreme toxicity, exerts its influence exclusively upon the interstitial and fibrous tissue." In his experiments Adler demonstrated the presence of nicotine in the liver, spleen, heart and intestines even after tobacco feeding had been discontinued for ten days.

That tobacco smoke is toxic for rabbits, has been demonstrated by experiments of comparatively recent date. Binet[2] found definite lesions in the cerebral cortex of rabbits after exposure to tobacco smoke. His experiments also demonstrated a disturbed memory in white mice resulting from the inhalation of the fumes.

Since it has been demonstrated that tobacco fumes are poisonous, there can be no doubt that the person who smokes in a poorly ventilated room injures the health of the other occupants as well as his own. Anyone who is not accustomed to tobacco can amply prove the toxic effects of tobacco smoke by riding for an hour or so in a smoking car; under such circumstances, he will be sure to suffer from headache and definite mental confusion.

The evidence that nicotine is the toxic agent in tobacco is conclusive. The proof of the pharmacologic laboratory should be sufficient to convince us that tobacco, since it contains nicotine, is necessarily injurious to the body; but, if we demand further evidence, we have only to scan medical literature to encounter such terms as tobacco heart, smokers' throat, tobacco enterospasm (leading to spastic constipation), smoners' tremor, nicotine amblyopia, etc. The role of the old clay pipe in producing cancer of the lip serves as another indictment against tobacco.

Nicotine Raises Blood Pressure

It is a recognized fact that nicotine raises the blood pressure and increases the heart rate. Bates[3] experiments demonstrated that smoking one cigar or three cigarettes produces a definite rise in the blood pressure and an increase of the pulse rate in healthy young men. The rise in blood pressure is usually only a few millimeters, but it may be more than 20 mm. The increase in the heart rate is generally less than ten, but it may be more than twenty. The increased blood pressure and heart rate subside to the normal in from twenty to thirty minutes.

When there is hardening of the arteries, the effect of nicotine on the circulation should constitute a definite contra-indication to smoking. An antitobacco campaign has been instituted by a group of the leading physicians of Austria. In their publicity literature, much stress has been placed on the far-reaching influence of nicotine in producing arteriosclerosis and certain diseases of the nervous system.

Smoking is undoubtedly an important factor in the production of arteriosclerosis. Unfortunately the development of this disease is insidious, so that the evil effects of nicotine poisoning on the arteries are not recognized until the condition is beyond repair. Some authorities believe that tobacco is more important even than alcohol in the etiology of arterosclerosis, ranking second only to syphilis. It is a well-known fact that sudden death from arterial disease is most common in heavy smokers.

Buerger (*The Circulatory Disturbances of the Extremities*) draws attention to the fact that "nicotine has a selective action on those ganglion cells in which an anotomical interruption of continuity takes place, with functional relaying of nerve impulses." Intravenous injection of nicotine as well as local application on a ganglion node "causes transitory excitation followed by paralysis of the ganglion cells that lie in the relay station."

Speaking on the etiology of thrombo-angiitis-obliterans Buerger says, "Tobacco is probably a predisposing factor and may be regarded at least as causing some alteration in the vessels that make them liable to the at-

tacks of inflammation and thrombosis. Most of the cases are heavy smokers although smoking was denied by one per cent of the author's cases." It is of interest to note that this author speaks of a series of 500 cases, and one per cent of non-smokers in 500 is a very small figure. Also evidence of rarity of thrombo-angiitis obliterans in women in this country is seen from this series of 500 cases; only 3 cases were observed in women.

Buerger notes that Erb attributes extensive arteherosclerotic conditions of the lower extremities to the influence of tobacco. Erb distinguishes 4 classes according to indulgence in tobacco (smoking) and from his statistics it is reasonable to conclude "that there is a preponderance of smokers among patients suffering from intermittent claudication (page 153). (The Circulatory Disturbances of the Extremities.)

Buerger cites the statistics as follows:

Non-smokers or almost non-smokers;

A second class of moderate smokers (3 to 6 cigars or 10 to 15 cigarettes);

A third class (7 to 12 cigars or 15 to 40 cigarettes);

The fourth class of excessive smokers (40 to 100 cigarettes). Of the 500 males, 44.8 belong to the first class, 31.6 to the second, 17.8 to the third, and 5.8 to the fourth. Of the cases of intermittent claudication however, 7 per cent belong to the first class, 14 per cent to the second, 50 per cent to the third, and 28.6 per cent to the fourth.

Dr. David I. Macht (*A. M. A.*, p. 900, Sept. 10, 1927: Toxicologic Note on Nicotine) reviewed the toxicology of nicotine and thus quotes Sollmann: "Nicotine is one of the most fatal and rapid of poisons; the vapor arising from a glass rod moistened with it and brought near the beak of a small bird causes it to drop dead at once, and two drops placed on the gums of a dog may cause a similar result. Macht cites Garvin's case (*Cleveland M. J.*, 12-30, 1913) of fatal poisoning in a child, age 6½ years, who received a rectal injection of 1 pint of water in which was dissolved 1½ teaspoonful of smoking tobacco."

Dr. I. S. Tunick in a personal communication writes the following:

"Regarding the role of tobacco on the circulatory disturbances of the extremities, there is no doubt in my mind that tobacco plays a very important role in these diseases. I have observed in my clinic at the Hospital for Joint Diseases that the great majority have been very heavy cigarette smokers. It seems to me it is not so much the number of cigarettes smoked, as the age of starting to smoke that determines pathological changes; the vast majority have started smoking in very early adolescence. While these diseases are more frequently observed in the Jewish race I would not call it exclusively a Jewish disease. I have seen it in all nationalities, but of course the great majority are Jewish, which is evidently due to instability of the vaso-motor nervous system, and therefore the poisons of tobacco may show greater deleterious results. I have never seen any true circulatory disturbances in females (except luetic, tabetic and Raynaud's), which may be due to the fact that smoking among women in this country until lately was not a very common habit; now with the prevalence of smoking in young girls and women I have no doubt that this condition will be seen in the next decade or so in women.

"The foreign literature reports a number of cases in women, which may be due to the fact that in Europe women have been smoking for some time.

"In young adults I have seen cases of vaso-motor disturbances due to tobacco, the manifestations of which are cyanotic extremities, excessive cold sweating of the extremities, and pain on walking without any disturbances of the pulse, and this condition improves very rapidly as soon as these individuals give up smoking or cut down on the number of cigarettes.

"Out of fifty cases taken at random from the records of my clinic of so-called thrombo-angiitis-obliterans, 47 were very heavy smokers; the number of cigarettes consumed a day varied from 8 to 40, but the most striking fact is that all started to smoke between the ages of 12 to 15 years."

Early Prohibition of Tobacco

It is interesting to recall that the smoking of tobacco was an old tribal custom of the American Indians, being introduced into Europe soon after the discovery of America. The practice became so widespread and obnoxious in Europe that laws were passed prohibiting the use of tobacco and severe penalties imposed by law. Nevertheless historians tell us that tobacco gained so strong a foothold in Europe during the sixteenth and seventeenth centuries that neither sermons from the pulpit nor long terms of imprisonment—not even the death penalty—restrained our ancestors from smoking.

Few inveterate smokers reading this article will be converted to the cause of tobacco abstinence. It is entirely too much to expect. When medical men fully cognizant of the toxic action of nicotine still persist in puffing the weed, how can we expect a layman with no true knowledge of the facts to stop smoking? My plea is for moderation in smoking by educating the public with regard to the dangers of nicotine. The legal prohibition of tobacco would probably do more harm than good, in that prohibition serves as one of the strongest of psychological stimuli for indulgence in a practice.

The average layman seems to have one standard argument in favor of his practice of smoking. He usually says, "I know old men in their seventies who have been smoking for years and are nevertheless in good health." One must concede that, even when used to excess, the harmful effects of tobacco are not apparent in many cases. On the other hand, medical men frequently encounter persons suffering definite ill effects from smoking comparatively small quantities of mild tobacco.

If the action of tobacco varies in different organs of the same person, it ought certainly to vary in the organs of different subjects. And clinical experience as well as animal experiments have substantiated the claim that there are great individual differences in the susceptibility to nicotine.

Comparative Harmfulness of the Pipe, the Cigar and the Cigarette

As to the method of smoking that constitutes the greatest evil, opinions differ. One view holds that pipe smoking, next to chewing tobacco, is the most harmful; next comes the cigar, and least of all the cigarette.

The opposing view is as follows: The active principle of tobacco is nicotine, a volatile substance that vaporizes when subjected to heat. A volatile substance naturally deposits on a cooler wall; consequently, the volatile nicotine from a cigarette, with its small area of radiation, gains immediate entrance to the upper respiratory passages. There it is deposited and subsequently absorbed into the system. For this reason, the dosage of nicotine absorbed as a result of smoking cigarettes is probably greater than from either cigar or pipe smoking.

Though the least becoming, the pipe is probably the least harmful medium for producing nicotine poisoning. An important fact is that, in the case of the pipe, the mouth is farthest away from the source of radiation.

Thus the pipe acts like a chimney to dissipate the products of combustion. The nicotine deposits on the bowl of the pipe may be scraped away from time to time—and they always should be. The cigar ranks intermediate between the pipe and the cigarette, because it is farther away from the mouth than the cigarette and less nicotine is therefore absorbed.

Digestive Disturbances from Tobacco

Rolleston[4] has recently emphasized the harmful effects of tobacco on the digestive system. He believes that a factor not to be overlooked in the etiology of cancer of the lip is the irritation caused by smoking cigarettes to the bitter end. In some persons, the injury caused by the hot smoke of certain brands of tobacco causes soreness of the tongue. According to Howard Fox[5], tobacco is the most important predisposing cause of leukoplakia buccalis.

Lickint's[6] studies have shown that tobacco definitely diminishes the activity of the gastric digestive juices, inhibits peristalsis and disturbs protein digestion. Lickint believes that tobacco may play an etiologic role in neuroses of the stomach, disturbances of its secretory function, gastritis and even ulcer and cancer of the stomach.

In *x*-ray studies of the stomach, Daniélopolu and his associates[7] observed a paralysis of the contracting power, starting ten or fifteen minutes after the first inhalation of the smoke and persisting for at least an hour; this paralysis was often preceded by a phase of gastric hypercontractility.

Wagner[8] has shown that the duodenal syndrome, that is the symptoms and roentgenologic findings of duodenal ulcer, may be produced by the excessive use of tobacco. I recall an instructive case of this type. The patient suffered from the classical symptoms of duodenal ulcer. When I learned that he was in the habit of smoking from thirty to forty cigarettes a day, I asked him to reduce the amount. He refused, calling me an antitobacco fanatic. Later he returned to me in a more humble state of mind with the story that the other physician had allowed him to smoke to his heart's content but that he had experienced no good effects from the treatment. With proper curtailment of the habits of smoking, the symptoms soon disappeared. I succeeded in disciplining this patient against the abuses of tobacco for many years.

Gray[8] in speaking of duodenal ulcer under a sub-caption of tobacco smoking relates that a man, age 21 years, had a typical symptom of complex of duodenal ulcer extending over a period of ten months prior to examination. The stomach chemistry (fractional method) showed a hypersecretory curve. Because of a stormy demeanor of the ulcus syndrome the patient was operated on with a negative pathology in the pyloro-duodenal region. This patient smoked thirty cigarettes daily. He stopped smoking for ten months and he was symptom free; when he resumed his tobacco smoking, the symptoms promptly recurred. Occult blood in the feces and roentgen study again were negative. "With the cessation of smoking", to quote the author, "the symptoms subsided and he has remained well since that date."

Even moderate smokers may suffer from toxic amblyopia, which disappears when tobacco is eschewed. The specific toxic effect of nicotine on the optic nerve and its pernicious influence in reducing visual acuity have been abundantly established. Tobacco may cause neuritis of the auditory as well as of the optic nerve. Four cases of auditory neuritis have been reported by Zaviska.[9]

Considering the present-day popularity of attempts at rejuvenation, it is rather surprising that women will persist in throwing away their youth for the sake of nicotine. There is indeed much evidence to substantiate the view that smoking causes premature aging. Experiments have proved that, in addition to its other harmful influences on the body, nicotine produces changes in the thyroid gland, which in turn are conducive to senility. Tobacco first excites the thyroid gland, but this stimulation is soon followed by exhaustion. Considering the importance of the thyroid gland as the hormone regulator of the body, the serious nature of thyroid exhaustion may be fully appreciated.

Especially reprehensible is the practice of smoking by a nursing mother. Cases of severe nicotine piosoning in the nurslings have been observed under such circumstances. Diarrhea is a frequent complaint of the infant when the mother smokes. Experience has proved that mothers who smoke cannot long continue to nurse their infants.

Recently a number of "nicotine-free" products have been advertised, the implication being that the inveterate smoker may enjoy all the pleasures of tobacco without the dangers of nicotine poisoning. However, there is serious doubt as to the possibility of removing the nicotine from the tobacco. Frank[10] found approximately as much nicotine in alleged nicotine-free cigarettes and cigars as in the ordinary products.

Public Education Required

Experience in the Netherlands has shown how serious a national situation may be precipitated when the youth and children of the nation are won over to the cause of nicotine. I believe that our government should take active steps to avoid a similar catastrophe in the United States. Antitobaccoism, to be effective, must arise from the understanding not through force. A national prohibition of tobacco would only give rise to an added incentive to smoking and ultimately lead to organized bootlegging of tobacco. But proper educational propaganda against excessive smoking would have a most beneficial influence.

Summary

Although many heavy smokers live to old age and show no apparent ill effects from their habit, still other individuals suffer definite harmful results from only moderate smoking. The explanation is that the poisonous effects of nicotine are insidious, and furthermore there are marked differences in individual susceptibility to this toxic drug.

A considerable number of serious disturbances are justly attributed to the abuse of tobacco. Cardiac irregularities, arteriosclerosis digestive complaints, cancer of the lip, leukoplakia buccalis, chronic pharyngitis, spastic constipation, the duodenal ulcer syndrome, toxic amblyopia, deafness, and premature aging due to thyroid exhaustion are some of the established indictments against nicotine.

The curtailment of the abuse of tobacco should constitute an important part of preventive medicine. A national prohibition of tobacco would be undesirable, as it would only foster wholesale tobacco bootlegging. The most promising method of lessening the evils of tobaccoism would be to spread educational propaganda informing the public of the true facts with regard to the influence of nicotine on the body. In this respect, it is unfortunate that so many physicians, fully realizing the toxicity of nicotine, expect their patients to desist from tobacco while they themselves smoke freely at the very moment of giving this advice.

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A Plea for Careful Consideration of the Feet in Periodic Heath Examinations

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Experience has taught us that a large number of individuals are disabled by foot ailments, most of which could have been avoided, had they been detected in their incipiency. With health examinations becoming more popular the writer makes this plea that more attention be given to the foot, so that foot abnormalities, which may be present, can be revealed during the examination, and with the institution of proper treatment, future suffering and loss of time in industry, can be obviated.

The erect attitude of man demands that the human foot shall be an organ for balancing the body in a much greater degree than in most other animals. Many of the disabilities of the foot and ankle are due to conditions disturbing the proper balance and therefore giving rise to complaints of weakness or pain from undue strain of such structures as ligaments and joint capsules, or undue pressure on bony structures and the parts covering them.

On examining the mechanism of the foot it is found to be divisible into several elements in each of which disturbances of balance with corresponding disturbances of function may occur and, when it comes to treatment, the same principles apply whether the original cause is direct trauma or some other disturbing factor.

The importance of the care of the feet cannot be overestimated. The proper fitting or adjustment of shoes, the correction of faulty habits of use, with the overcoming of elements of weakness, as well as the direction of the hygiene of the feet, are factors upon which depend the fitness for duty of large numbers of industrial workers.

The average individual wears shoes which are as small as can be used without actual discomfort. The socks worn are of such texture as to occupy but little space. Such coverings of the feet may meet the needs of some workers, especially those who pursue sedantary occupations in which the physical activities are slight. However, they are harmful and inadequate where walking and standing are required, since the action of the muscles of the feet are interfered with. Interference with proper action of the muscles tends to weaken them. Weak foot muscles usually predispose the individuals to weak or flat feet.

Some occupations, such for example, the pursuits of salespeople, policemen, letter carriers or waiters, demand the hardest kind of use of the feet and, to make this possible the shoe covering should interfere the least that is possible with foot action, while there should be ample room for warm soft socks, not only to protect the feet from chafing, but to furnish an absorbent for the moisture that will be developed. Corns, both hard and soft, bunions, callosities, deformed toes, blebs and many other foot ailments could all be avoided, if careful attention were to be given to the proper fitting of shoes and socks.

It is not uncommon to find that practically all men and women require shoes that are from a size and a half to two sizes longer than had been worn previously and with relatively narrow widths. Sizes as large as this are required especially in the winter when the use of warmer and thicker socks is expected. The common habit of simply increasing the width of the shoe without increasing the length is to be carefully avoided since it results in added cramping of the toes and allows the feet to spread, thus increasing the potential difficulty that exists naturally.

In fitting, the individual should stand with the shoe on and there should be at least three-quarters of an inch between the tip of the great toe and the end of the upper part of the shoe when the full weight is borne upon the foot.

While these precautions are important for men or women with relatively normal feet in order to lessen as much as possible the development weakness, it is of greater importance for the large number of individuals with weak feet, which inevitably exists.

The commonest cause of foot deformities and disabilities, is poorly fitting conventional foot wear. Of course there are other factors which tend to aggravate the symptoms, but the main cause is shoes which do not fit the foot properly. One often hears the term "breaking the shoe in," when new shoes are worn. This term is misapplied, as what really happens is that the foot is "broken in." The foot, being more flexible than a shoe, naturally is more easily deformed. This cramping of the foot continues until the foot has assumed the shape of the shoe, at which time the shoe is said to have been "broken in." In other words, the foot is made to fit the shoe, with consequent damage to the muscles, toes and arches.

Fortunately, in industrial life, the laborers rarely possess such disabilities and deformities. Their foot disabilities result from foot injuries and inflammatory processes in and about the foot. They usually wear broad-soled shoes which also fit their feet properly in the length. One rarely, if ever, can see these individuals seeking relief for corns, bunions and cramped toes. We should profit from their experience and educate every one in the advantages to be gained by wearing proper, anatomically correct footwear.

The office workers and the fashionably dressed individuals are not blessed with such good fortune. They usually wear fashionable, conventional shoes with the inevitable resulting damage to the feet and the long train of symptoms referrable to it.

The feet should be examined periodically, just as are the teeth, eyes, heart and lungs, and where the indication exists, proper treatment should be instituted.

The proper precautions necessary are first, good anatomically correct shoes and second, foot exercises.

These exercises should be performed regularly, for fifteen minute periods, twice a day. Bicycling, tip-toe exercises, raising the body while standing upon the outer borders of the feet are very efficient ones to practise.

Where there is a tendency towards weak or flat feet, the inner borders of the soles and heels should be built somewhat thicker than the outer borders, the amount of thickening depending upon the degree of weakness present. The usual thickness that is inserted is about three-eighths of an inch. The object of this wedge of leather is to transfer the weight of the body from the inner border of the foot to the outer border, in that way relieving the arch of the foot from undue strain. Where, in spite of the fact that proper precautions have been taken and foot pain and disability still persist, proper arch supports may have to be resorted to, before relief can be obtained.

The arch supports are made of steel and are fashioned after a plaster model, made from the foot of the patient. These arch supports must be made for each individual and should be altered from time to time so as to conform with the changes taking place under their use. They should be worn at short intervals at first, gradually increasing the length of time, as tolerance is established, when they can be worn the entire day.

In acute weak or flat feet, that is, the type in which the symptoms come on suddenly, rest in bed, followed by strapping with adhesive plaster gives the quickest relief.

There is another type of weak foot which does not respond to the treatment just outlined. This type is known as rigid or stiff weak foot. It is one in which the arch is not only flat, but the movements of the foot are restricted. Fortunately, this type of weak foot is not as common as the flaccid or loose type. For a patient who must be returned to his work as soon as possible, because of financial and other responsibilities, the best method of treatment is to break up the stiffness under an anesthetic and apply plaster of Paris bandages. The bandages should be retained for a period of thirty days. After the thirty days have elapsed, the plaster bandages should be removed and impressions of the feet taken, from which the models are made. From these models the arch supports are fashioned. The feet should then be replaced in the plaster bandages until the arch supports are ready. This is usually from four days to a week later.

After the braces are ready, a good orthopedic shoe having an elevation of one-half an inch on the inner border of the soles and heels should be prescribed. It is very important to impress upon the patient that the treatment does not cease at this stage. He should still practise the exercises and if possible should have electric baking and massage for his feet. This treatment should be continued until all the movements of the feet are free and painless.

Bunions are another common source of suffering and disability. They are usually associated with flat feet and usually result from wearing narrow shoes. They are deformities located in the first joint of the big toe, characterized by a deflation of the big toe, with in many instances, an enlargment of a small sac, which sac forms the bunion. The degree of deflection may vary from a slight one to one that is so marked that the big toe may lie either over or under the second toe. In some of these latter instanes the patients walk upon their big toes.

In the normal foot the toes are straight, lie flat and can be moved downward. The inner border of the heel, the inner side of the big toe lie in a straight line so that in a normal foot a ruler applied to the first two points should come in contact with the inner side of the tip of the big toe. The conventional shoe is not made to permit this relationship to exist. The inner border of the conventional shoe is not straight. It is only partially straight to a point just behind the first joint of the big toe, beyond which it curves abruptly outward to meet the outer border of the shoe. A normal foot pressed into a shoe of this type will soon assume the same shape with the consequent outward deflection of the first joint of the big toe and an inward deflection of the little toe. The skin overlying the prominence formed by the bunion is not affected in the early cases. Later it becomes inflammed and in some instances may become the site of an infection.

The symptoms of a bunion depends upon the condition present. As a rule there is pain in the big toe, redness, local heat and swelling. When an infection of the bunion occurs there usually is aggravation of these symptoms plus the addition of pus.

Bunions are preventable deformities. People should be educated to wear anatomically correct shoes in preference to the conventional. They should be impressed with the dangers that may arise from forcing their feet into shoes that are too narrow for them. The writer has observed by actual measurements that the average foot is one inch wider than the shoe worn by the individual. These shoes are not only too narrow but are from one to two sizes too long.

In mild cases of bunion a proper shoe will usually prevent further development of the deformity. Exercises of the toes may prove of assistance. In some instances felt wedges placed between the first and second toes have proved of value.

When inflammation is present, the application of wet dressings for a number of days will usually overcome it. During this stage it is of advantage to pad the inflamed area with a piece of felt perforated at its center. This will protect the sore spot from further irritation of the shoe.

Strapping the toe in such a manner as to straighten it has proved of value in mild cases.

When in spite of these precautions, the deformity continues to progress, or in cases where a well marked deformity already exists, operative interference is necessary before one can expect a satisfactory result. The operation should not be performed while there is any inflammation of the bunion or the surrounding tissues. It should aim not only to correct the deformity but also to preserve motion in the first joint of the big toe.

Hammer toe is a deformity of the toe, usually the second, occasionally several, characterized by bending of the toes in a hooked manner. The prominent knuckle which results, is usually the site of painful corns. Some individuals are born with hammer toes. The common cause howeveer, is poorly fitting and tight shoes. Socks that are too short are also responsible for the production of hammer toes in some instances. Hammer toes are often associated with bunions and a flat anterior arch.

As a rule the patients seek relief from the pain resulting from the corns which form on the top of and tip of the toe. Occasionallly they will seek relief for cosmetic purposes. Total disability is not rare. The treatment is distinctly operative, the object of which is to straighten the bent toes.

Metatarsalgia is a painful disability of the foot due to a flattening of the anterior arch. Pain is characteristic and is usually referred to the fourth toe, occasionally to the third and the second. The pain is stabbing or burning in character. When there is a callus on the sole of

the foot, pain and a burning sensation are referred to that area. Disability as the result of the deformity is not uncommon.

As this condition is commonly the result of wearing poorly fitting shoes and socks, the first thing to do is to see that anatomically correct shoes and well fitting socks are substituted, before treatment is instituted. As a rule good shoes, with exerecises, will usually suffice to obtain satisfactory results. Occasionally we must resort to a support and any one which will maintain the anterior arch in its proper position will be satisfactory. For relief of the acute pain a pad of felt retained in position by adhesive plaster, will usually prove effective.

Corns, another product of improper foot wear, are small localized thickenings of the skin, the peripheral part consisting of a number of layers of parallel epidermic cells and the central part being formed by a dense mass which presses on the papillae and the dermis and causes more or less atrophy of these structures. Not infrequently a small bursa forms beneath the center of the corn, and, if the irritation persists, inflammation and suppuration may occur in it and the condition thus produced is known as a suppurating corn. Corns are usually found on the outer side of the fifth toe and the back of the second, third and fourth toes.

The symptoms are chiefly pain, aggravated by the changes of weather and the wearing of socks and shoes. When the shoes and socks are removed, relief is usually obtained, except in cases where inflammatory processes have commenced. The pain at these times are of the throbbing pulsating variety.

Corns usually result from shoes that are either too tight or too lose. In the former instance pressure is produced and in the latter friction. Imperfections in the socks, such as knots in the worsted or poor workmanship in the darning, are also causative factors.

Soft corns usually are found in between the toes. They result from pressure of the shoes, with retained perspiration, which is unable to escape. They are white, macerated growths.

In the treatment, absolute cleanliness of the feet must be insisted upon. The part must be kept dry and pressure on any prominent points avoided. Pointed shoes must never be worn. When a corn has formed, all pressure should be taken off it and not infrequently the avoidance of pressure alone is sufficient to lead to the separation of the dense core and to a complete disappearance of the trouble.

Pressure may be avoided in various ways: when the corn is situated between two adjacent toes, a piece of felt inserted between them, so as to prevent pressing on one another, will relieve the pressure and so bring about a cure. In the sole, pressure is best relieved by a hollow ring-pad, the corn being made to occupy the center of the ring. The disappearance of the corn may be much accelerated by paring down the dense core with a razor, after the toe has had a prolonged soaking in hot water. In paring down the thick epidermis care must be taken not to go deep enough to injure the living tissues, because the epidermis of a corn often contains much septic material which may be introduced through the incision in the skin and lead to serious infection.

As a rule, after the source of pressure has been removed, and the corn has been pared several times, it is not difficult to pick out its core with a needle, when the skin of the part will very soon resume its normal appearance if further pressure be avoided. When the corn is large, it is well after paring it to apply salicylic collodion once a day repeating the parting if necessary about once a week. If the corn is situated between the toes, care must be taken to keep the latter well apart until the collodion is thoroughly dry.

When there is a suppurating corn, the patient should be made to rest and the abscess should be opened by an incision through the center of the corn. The pus usually forms in the bursa beneath the base of the corn and, though only small in amount, may from the tension under which it is retained cause exquisite pain long before it gives rise to fluctuation or any other characteristic sign of an abscess. When the corn has been cut through and the pus allowed to escape, the relief is immediate. The entire corn which is undermined by the abcess should then be clipped away with scissors and wet dressings applied. They should be changed frequently and continued until all acute symptoms have subsided.

Blisters on the feet are occasionally encountered. They are as a rule of little moment, especially if properly treated, but they may give rise to great inconvenience and may prevent the patient from walking. This is especially so of policemen, letter-carriers and others who are obliged to walk and stand a great deal of the time. They occur about the heel, the instep or the toes. A blister is of importance partly from the physical pain in walking caused by the irritation of exposed nerve ends and partly from the susceptibility to infection, lymphangitis, cellulitis, etc., that have always to be reckoned with in these cases.

The preventive treatment must not be neglected. It consists mainly in observing scrupulous cleanliness of the feet and avoiding tight or too loose shoes, or undue pressure or friction on any one particular part. A further precautionary measure, which it is well to employ is to rub the feet well with fat or tallow.

When blisters have occurred the best plan is to puncture them at their most dependent part after having washed them well in any antiseptic solution, so as to disinfect the surface. After the fluid they contain has escaped, suitable measures must be taken to prevent any further friction, so that the separated epithelium may remain in contact with the raw surface beneath and protect it against external sources of irritation. If possible, rest should be enforced. If the patient is compelled to get about, some form of hollow pad designed to keep the pressure off the blister should also be provided. When it is merely necessary to prevent the surface of the blister from being irritated by the clothes, a very useful method is to protect the affected area by means of a perforated convex celluloid shield.

Callosities are indurated, prominent yellowish portions of skin, shading off at their edges and consisting essentially of thickening of the horny layer of the epidermis. They are due to repeated friction and may be preceded by blisters. Relief of the pressure will lead to disappearance of the callosity, but while it lasts the callosity is often extremely painful and a burso may form beneath it and become inflamed and suppurate.

When the callosity is causing pain, it is well to shave off as much of the thickened epidermis as possible, after softening it by prolonged soaking in water as hot as can be borne, and then to apply the salicylic collodion. This application is to be repeated night and morning. This should be combined with the use of a hollow pad to prevent pressure. The pad should overlap the thickened area for three-quarters of an inch in all directions and a hole corresponding in size to the callosity should be cut in its center. This treatment will usually lead to the disappearance of the affection.

Hypertrophy of the nails of the toes is not an uncommon cause of disability. The nail is usually thickened and marked by transverse depressions, while its tip be-

comes unduly curved. In some individuals the nail of the great toe may assume the shape of a horn, the point of which turns over towards the sole or curves around and threatens to grow into the nail matrix or the free end of the toe. This affection often results from inflammation or injury.

When a nail that is subject to hypertrophy assumes the shape of a horn, it must be carefully pared, as otherwise its tip will grow into the nail matrix and cause ulceration. When the horn is very massive and dense, the entire nail and its matrix may require removal.

Contusions of the nails are often followed by separation of the nail from its bed. The usual effect of the contusion is to cause hemorrhage between the nail and the matrix. When the latter has been badly contused and blood is seen as a black mass beneath the nail, separation of the latter can sometimes be prevented by making a hole through it over the hemorrhage so as to allow the blood to escape. That is easily done by scraping with a knife until the nail is thin enough to permit of the introduction of one blade of sharp-pointed scissors. The operation is quite painless. A wet dressing should be applied to prevent occurrence of suppuration beneath the nail.

Another condition which gives rise to a great deal of trouble is that known as lateral onychia, or as it is commonly called, from the fact that it exclusively affects the toe, "ingrowing toe-nail." In this condition there is an inflammation of the matrix and the skin at the side of the nail, generally on the outer side of the great toe. It usually occurs in young adults of the working class, who have much walking to do, who do not keep the feet clean, who wear badly fitting shoes and cut the great toe nail so short that it does not project beyond the soft parts. The result is that the nail is pressed down and irritates the lateral fissure or, what comes to the same thing, the soft parts of the toe are pressed against the nail. Hence the affection, as a rule, occurs near the free end of the nail. It begins with slight pain and swelling, which impede walking. Ulceration soon occurs and spreads backwards along the lateral groove. In severe cases the suppuration is abundant and fetid; there is a great deal of swelling and the granulations are exuberant. The condition is often serious on account of the pain and lameness it induces and also on account of the risk of lymphangitis.

The treatment will vary according to the stage of the disease, but in all cases what may be termed the hygiene of the foot should be carefully attended to. The nails should be cut square and their edges should project slightly beyond the soft parts. The feet should be kept clean, the socks changed frequently and the patient should wear anatomically correct shoes. If the case is seen before any ulceration has occurred it suffices to introduce a minute pad of cotton between the nail and thee lateral groove so as to release the pressure of the edge of the nail, the other points in the hygiene of the foot being carefully attended to. This procedure is most likely to succeed when the nail is thick and well developed. When it is thin and papery it is of little use. If the ulceration has occurred, however, this plan will not suffice.

In the later stages, various other methods are resorted to, but all, with one exception, are more or less ineffectual. This one is an operation, the object of which is to remove part of the nail and destroy the matrix, so that the nail does not grow back again.

There are many conditions in which symptoms are referred to the feet and which are not readily recognized, because they do not occur commonly. They do, however, occur frequently enough for us to remember, when subjecting the patient to a periodical health examination.

Erythromelalgia is a chronic disease, first described by Weir Mitchell and hence also called Weir Mitchell's disease, in which a part or parts of the body have pain, flushing and local fever, aggravated when the parts are dependent. It commonly involves one or more extremities. Redness, pain and swelling are the cardinal features of the disease. The swelling may be moderate and most evident about the ankle and the tarsus. The redness, which is usually localized to the feet, becomes more marked when the limbs are dependent. Exertion aggravates the pain. The parts are hot. The swelling does not pit on pressure. The pulsation in the dorsalis pedis artery is usually much fuller and more evident than in the normal foot. The most striking feature of a case is the redness which in typical instances is the color due to an active hyperemia, a deep pink or violet-red, diffuse, not mottled and sometimes sharply limited above. The veins may be swollen, but the general appearance is that of an inflammatory congestion, not of a venous stasis. One of the most remarkable features upon which Weir Mitchell laid great stress was the influence of the change of posture; when the foot hangs down the congestion increase; when placed upon the level of the patient's body, it grows pale, and the congestion may almost completely disappear. The temperature of the affected limb is always higher, the part feeling hot and the arteries of the foot may be felt to throb.

Pain is almost always present, either an intense burning sensation or a sharp stabbing sensation of a less continuous character. When at rest there may be nothing more than an unpleasant hot feeling, but on movement, as in attempting to place the foot upon the ground, the pain may be severe. The slightest pressure with the finger may produce pain. Serious trophic changes leading to gangrene do not occur.

The next condition to be remembered is arterio sclerosis, which is a distinct and separate disease of the blood-vessels, not infrequently beginning in the arteries of the extremities. Pain in the forefoot is occasionally the initial symptom, usually involving the second toe. It is most common in people over fifty years of age. Coldness and blanching of the affected parts are early signs. Blueness of the foot and a feebly pulsating dorsal artery in a patient over fifty should make one suspicious of the presence of arterio-sclerosis. Finally, an *x*-ray picture will usually reveal the sclerosed vessel. Gangrene is a later or terminal symptom.

Raynaud's disease is an affection of the blood-vessels, occurring mostly in emotion or neurotic women between the ages of eighteen and thirty. It usually begins with an ischaemia. The affected part becomes bloodless and white. In certain cases there is a deep, dusky congestion of a cyanosed part with or without gangrene. Pain may be absent or acute and comes and goes. It has no relation to posture. The condition is unaffected by seasons. In many instances all symptoms are brought on by cold. There is anesthesia to the touch in the affected parts. There may be analgesia. The temperature of the affected part is lowered and unaltered by position. Gangrene is local and limited and likely to be symmetrical.

Thrombo-angitis obliterans, occasionally called Burger's disease, is also a blood-vessel disease, characterized by painful, cold, swollen toes, wax-like in appearance. Most of the cases occur in Polish, Galician or Russian Hebrews, young males between the ages of twenty and thirty being most frequently affected.

In contrast to Raynaud's disease, as a rule but one foot is affected and while the parts are red when de-

pendent, they become blanched when elevated. The pain is usually worse at night, walking may relieve it. The most constant symptom is the feebleness or complete obliteration of the pulsation of the dorsalis pedis artery. Of course when gangrene appears the diagnosis is easily made.

In concluding the writer stresses the following points:

1. A careful examination of the feet should be included in all periodic health examination.
2. Foot exercises, proper orthopedic shoes and hosiery should be recommended, both for the therapeutic and prophylactic values that may be obtained therefrom.
3. Those being examined should be impressed with the importance of protecting the feet against dampness and cold, by wearing of woolen socks and rubbers. This should be especially recommended to those who pursue outdoor occupations.
4. Proper hygiene of the foot should be advised.
5. Since most of the foot ailments are avoidable. suggestions as recommended in this discussion, if carried out, will keep at a minimum in the vast majority of instances, suffering, disability and loss of time from business.

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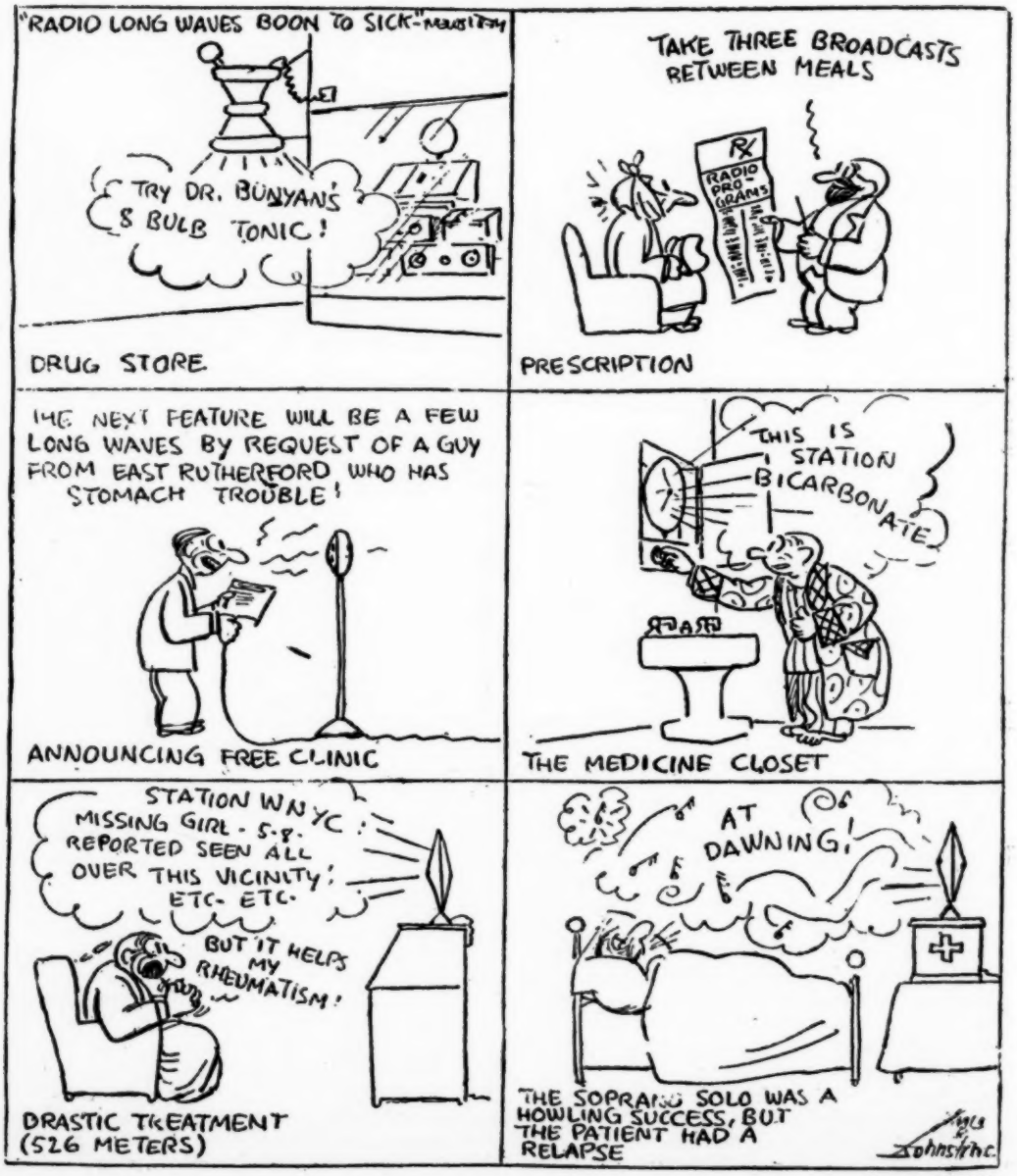
STATION M. D.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Brain

DR. ARTHUR MACDONALD
Washington, D. C.

(Concluded from page 34, February number)

Brain Weight and Racial Intelligence

It will be noted in the last half of tables 14 and 16 that the more advanced nations have superior brain weight.

Table 14.—*J. B. Davis. Philos, Trans.*, 1868, 505-526

	No.	Brain Weight oz.	grams.
European races	299	48	1367
Asiatic races	124	46	1304
African races	53	45	1293
American races	52	46	1319
Australian	24	43	1215
Oceanic races	210	46	1319
		grams	ounces
Herzog: 113 Filipinos, av. brain weight		=1333	47
Ziehen: some 500 Europeans av. brain weight		=1353	48

Table 15.

105 English and Scotch (Peacock)	1427 grams	(50	ounces)
28 French (Parhoppe)	1334 "	(47	ounces)
40 Germans (Huschke)	1382 "	(48	ounces)
18 Germans (Wagner)	1392 "	(48.1	ounces)
50 Austrians (Weisbach)	1342 "	(47.3	ounces)
7 African Negroes (diverse specialists)	1238 "	(43	ounces)
8 African Negroes (Broca)	1289 "	(45	ounces)
No.			
278 Europeans (average)	1403 "		
141 Negroes	1331 "	(46.9	ounces)
24 Pure whites	1424 "	(50	ounces)
25¼ white	1390 "	(48	ounces)
47½ white	1334 "	(47	ounces)
51¼ white	1319 "	(46	ounces)
95⅛ white	1308 "	(46	ounces)
22⅞ white	1280 "	(43	ounces)

The figures of Herzog and Ziehen, and also in table 15, giving the results of some leading specialists, confirm the opinion that, as a rule, superior races have a superior brain weight.

Table 16.—*Cranial Capacity and Race.*

Races and Nations	No. of Skulls	No. of cubic Centimeters
Australians	8	1228 (73.3 c.in.)
Hottentots	3	1233 (74.0 " ")
Peruvians	152	1233 (74.0 " ")
Americans	341	1315 (78.8 " ")
Negroes born in America	12	1323 (79.3 " ")
Mexicans	25	1338 (80.2 " ")
Negroes (in general)	76	1347 (80.7 " ")
Negroes born in America	64	1371 (82.2 " ")
Wild Indians	164	1376 (82.5 " ")
Parisians	35	
Parisians (cemetery of)	117	1409 (84.4 " ")
Parisians in 12th Century	115	1425 (85.4 " ")
Germans	30	1448 (86.8 " ")
Parisians of 18th Century	125	1461 (87.6 " ")
Anglo-Americans	7	1474 (88.4 " ")
Parisians (private graves)	90	1484 (89.0 " ")
German in general	38	1534 (92.0 " ")
English	5	1572 (94 " ")

Not being able to obtain the direct weights of the brain in sufficient numbers in the various races, we must take the cranial capacities as a general index of the weight of brain.

Prehistoric Brain Weight and Cro-Magnon Race

A prehistoric indication of relationship btween size of brain and racial intelligence will be found in the great Cro-Magnon race, which flourished some 25,000 or more years ago.

It is generally held that the superior races eventually occupied Western Europe. The Cro-Magnon race entered Europe from the East.

In table 17 is given the "cube brain capacity" of various races, as will be noted from an examination of the table.

Table 17.—*"Cube Brain Capacity" (Osborne).*

	Male	Female	Maximum
Cro-Magnon cavemen of Mentone	1550		1590
Average modern European	1450	1300	
Race of Ofnet	1400		
Living broad head race of Czechoslovakia	1230	1000	1800
Native Australian race	1310	1154	
Native Indian Veddaks	1000	1040	1400
Papuas of New Guineas	1236	1125	

The Cro-Magnons, the Greeks of pre-history, rank very high; they represent a blend of long and broad heads. Their very high modern brain power is shown by their extreme accuracy of observation of animal form as noted on the walls of their cave dwellings. It was a race of warriors, hunters, painters and sculptors. Though long headed, its face is very broad for its height, a unique feature. The upper part of the face is almost vertical, as in the highest types. Keith pronounces the Cro-Magnon characters to represent one of the finest races the world has ever seen. According to Ripley, this race is perhaps the most striking known instance of a persistency of population, unchanged through thousands of years. Such facts appear to indicate, that the human brain in the last twenty-five thousand or more years has been growing less in weight.

Had this Cro-Magnon race enjoyed the advantages of a written language, we might have had a prehistoric Phidias and Raphael, a Socrates and Plato, a Shakespeare and Dante. The author heard Virchow say, while holding up before his students a Cro-Magnon skull: "Would that any of us had such a skull and its brain within."

Close Relation Between Cranial Capacity and Brain Weight

The close relation between cranial capacity and brain weight is shown from the following table of Bolk:

Table 18.—*Relation of Brain Weight to Cranial Capacity (Bolk).*

Age		Brain Weight		Cranial Capacity per cent.
30	between	73.7	and	94.0
40	between	90.0	and	96.5
50	between	90.0	and	95.6
60	between	89.2	and	93.4
70	between	88.1	and	93.8
80	between	85.2	and	90.0
90	between	84.1	and	88.4
over 90			815	

After the age of 20 years, the cranial vault does not increase in volume, and in woman after 18 years of age (Marchand's Handmann). This is not in accord with Bolk's table above. This, as so often happens, shows normal differences between not only individuals and groups, but locations, countries and racial antecedents. In general (Martin), based upon many authorities, the average European cranial capacity is 1,450 (87 cubic inches) for men and 1,300 (78 cubic inches) for women. Under 1,200 (72 cubic inches) capacity, Hottentots show

51 per cent; Australians, 45 per cent; Germans, 8 per cent; Chinese, 2 per cent.

Over 1,300 c.c. (78 cubic inches) the Hottentots show 16 per cent; Australians, 28; Germans, 75, and Chinese 92 per cent (Buschan).

The shape of head may have some influence, since brachycephaly has greater volume in relation to its surface.

According to Scharpff and Richard, the difference between cranial capacity and brain volume is normally 10 to 16 per cent, higher figures mean atrophy, and lower ones indicate a swelling.

Cranial Capacity and Size of Body

Table 19, showing cranial capacity in relation to size of body, indicates that races of small growth have an absolute low average cranial capacity, and vice versa. Amadi has shown the same is true to a certain extent within races. But the variation between individuals is very great, from 1,100 to 1,700 c.c.m. (66 to 102 cubic inches), which is attributed to heredity. The physiological limits are still greater, 950 and 970 c.c.m. minima (56 to 57 cubic inches) (Adamanen), and (Trooler) maxima, 1,950 and 2,020 c.c.m. (116 and 121 cubic inches).

Table 19.—Cranial Capacity and Size of Body (Amadi).

	Size of Body.		
Capacity of skull.	Great per cent.	Medium per cent.	Small per cent.
Great	36	29	19
Medium	47	54	42
Small	16	17	38

Among the same people the size of body and cranial capacity are proportional; but the size of body reaches its maximum much sooner than the cranial capacity, so that very great size of body may belong to somewhat small cranial capacity (Ranke).

Estimating Cranial Capacity

The estimation of cranial capacity is not only of importance in itself, but it is necessary for the calculation of brain weight, from outside measurements of either the head or of the skull. To find out the amount of space in a skull, it appears that the same measurer, by diverse methods, can obtain close results, but for two or more measurers the results are not so close, and may differ from 15 to 40 cubit centimeters (1 to 2 cubit inches), which is 1 to 3 per cent of discrepancy, due to personal equation. This difficulty has led to finding of an equation for calculating the capacity of the skull from outside measurements of it, without measuring its inner space by seed, shot, sand or water. This difficulty of anthropologists has been solved by the mathematicians who have constructed equations or formulas by which the space in a skull can be estimated almost as correctly as different anthropologists can do by the laborious method of filling the skull with seed, sand or shot and shaking it until every crevice is filled, before pouring the seed, etc., out of the skull in order to measure it.

When we consider not only the personal errors of various anthropologists, but their different methods of measuring the skull, a mathematical formula with an error of not more than 40 cubic centimeters will serve to measure cranial capacity; especially so where the skulls are too fragile to be filled with sand or seed or shot and be shaken.

The Lee-Pearson formula is one which may serve as well as any. It is:

For males:

Cranial capacity = .000337 × length × breadth × height of head + 406.01.

For females:

Cranial capacity = .000400 × length × breadth × height of head + 206.80.

The prediction of cranial capacity of the living individual can be done with an average error of 3 to 4 per cent, and the prediction of the cranial capacity of a race, without the use of sand, seed or shot, can be done to a degree of accuracy comparable with that of the direct method, owing to the personal equation of the measures even when using the same method of direct determination.

Estimating Weight of Brain From Head Measurements on the Living

The ratio that brain weight bears to the outside measurements of the head in case of death from accident, or from acute diseases, or in death from wasting disease, shows that the diminution of brain weight in wasting disease even, though measurable, is small (Gladstone). In other words, the brain weight appears in general to be little affected by body disease or other conditions. The estimation of brain weight from outside measurements of the head on the living is only affected by the thickness of the scalp and hair. After middle age the hair and scalp become thinner with age; also the weight of the brain lessens, so that the proportion between the outside measurements of the head and brain are not materially affected by age.

Attempts to estimate the brain weight of the living in connection with cranial capacity are relatively recent. The difficulties are numerous. In a normal skull of 1,400 cubic centimeters (84 cubic inches) capacity there is about 100 cubic centimeters (6 cubic inches) of free space (see table 4) without the brain, which probably increases after the age of sixty or possibly before.

The estimating of brain weight upon the living by means of equations is in its beginning, and doubtless there will eventually be a large number of equations, or formulas, each adapted to different races, and in the same race to different classes of individuals or groups.

Blakeman and Pearson have worked out numerous formulas to estimate brain weight upon the living, which are called "Prediction Formulae." One of his main formulas for males is:

1. W. (brain weight = 1987 P + 8644 U — 1.1910 A + 1.7508.S + 36.8559, where P is product of head length, breadth and height; U is head circumference; A, age, and S, stature. In this equation the probable error of prediction is 48.5 grams (1.7 ounces), and error of mean 57.4 grams (2.0 ounces).

Another formula is:

2. Male brain weight = .2519 P + 374.7628.

The probable error of prediction is 49.9 grams (1.7 ounces) and error of mean 59.0 grams (2.7 ounces).

This formula requires much less time to use, and the difference from the first one in probable and mean errors is small. The addition of more elements to the formula does not always improve it. The product (P.) of the three head measurements is the foundation of the formula, for it should be remembered that the volume of an eclipsoid is proportional to the product of its three diameters.

The Lee-Pearson formula for estimating cranial capacity from outside measurements of the head is (head length-11) × (head breadth-11) × (head height-11) × .000337 + 406.01.

Modification of the Lee-Pearson Formula

The author tested this formula, based on the results of 117 autopsies, and found it necessary to change the formula as follows: (head length-5) × (head-wirth-6)

× (head height-5) × .000337 + 406.01 = cranial capacity in cubic centimeters.

Then Welcker's method is used to estimate the brain weight from the cranial capacity, thus:

When the cranial capacity is

1200 to 1300 cu. cent. (73 to 78 cu. in.), it is multiplied by .91
1300 to 1400 cu. cent. (78 to 85 cu. in.), it is multiplied by .92
1400 to 1500 cu. cent. (85 to 90 cu. in.), it is multiplied by .93
1500 to 1600 cu. cent. (90 to 96 cu. in.), it is multiplied by
1600 to 1700 cu. cent. (96 to 100 cu. in.), it is multiplied by

The reasons for subtracting 5 millimeters instead of 11 millimeters from head length, and 6 millimeters instead of 11 from head breadth, and 4 from head height instead of 11 are based upon measurements made at 117 autopsies on white males.

These changes of the Lee-Pearson formula are based upon the following table:

Table 20.—117 *Male White: Thickness of Scalp* (117 *Autopsies*).
Length of head minus length of skull=4.9 mill. (0.192 inches)
Breadth of head minus breadth of skull=6.2 mill. (0.243 inches)
Height of head minus height of skull=5.3 mill. (0.202 inches)

In the Lee-Pearson formula 11 millimeters (0.433 inches) are subtracted from each of the three head measurements, which is theoretically correct, the assumption being that the thickness of the scalp being approximately the same for each side of the head, and at the points from which the length and height are measured, should be doubled.

But at the autopsy table first the head and then the skull (after turning down the scalp) are measured. The results here are much less, as shown in table 20; that is, instead of 11 millimeters, about half of 11 should be subtracted from the outside head measurements. To show the cause of this discrepancy, the author used a little pressure in measuring the thickness of the scalp directly in seven autopsy cases at the usual points for taking the three head measurements upon the living, with the following results:

Table 21.—*Effect of Pressure on Scalp in Millimeters in head measurements.*

	Length	Breadth	Height
1	3.25 (0.127 ins.)	3.50 (0.146 ins.)	2.50 (0.098 ins.)
2	2.50 (0.098 ins.)	3.20 (0.125 ins.)	2.50 (0.098 ins.)
3	1.75 (0.066 ins.)	1.50 (0.058 ins.)	1.50 (0.058 ins.)
4	3.00 (0.118 ins.)	3.00 (0.118 ins.)	2.00 (0.079 ins.)
5	2.00 (0.079 ins.)	2.00 (0.079 ins.)	2.00 (0.079 ins.)
6	2.00 (0.079 ins.)	2.00 (0.079 ins.)	2.00 (0.079 ins.)
7	2.00 (0.079 ins.)	2.00 (0.079 ins.)	2.00 (0.079 ins.)
Av.	2.45 (0.095 ins.)	2.06 (0.081 ins.)	2.35 (0.091 ins.)

Tweezers were used to bring slight pressure upon the scalp, as near as could be judged to the pressure made by the caliper points. It is possible the author pressed a little more with the tweezers than that made by the pressure of the caliper ends. The pressure on the scalp will vary, according to measurer, to bluntness or sharpness of caliper points, and to haste or slowness in taking the measurements.

The patients in the Government Hospital for the Insane come from all sections of the United States. As is well known, most all brain estimates are based upon general hospital populations, which are not very representative of the general population of a country, as they are mostly from the lower middle classes. In addition, they are somewhat deteriorated from disease (especially chronic cases) and other various causes. In answering lay questions the author has humorously said: "Why, I find it almost impossible to get the brains of decent people."

It is probable, therefore, that most of the formulas[1] to estimate cranial capacity and brain weight upon the living from outside measurements of the head give results below the actual weight, especially when applied to the higher classes.

For estimating the cranial capacity from the skull circumference, instead of the diametrical product, the Lee-Pearson formula is:

For males:

$$\text{Cranial capacity} = 7.060 \times \text{circumference} - 220.98;$$

$$\text{probable error} = \frac{47.72}{\sqrt{n}}$$

For females:

$$\text{Cranial capacity} = 5.974 \times \text{circumference} - 1705.73;$$

$$\text{probable error} = \frac{38.78}{\sqrt{n}}$$

Cerebral Localization

To consider properly the subject of cerebral localization would take us far beyond the limits of this article. Still, certain things might be noted in the way of refreshing our memory. The cerebral cortex makes its first appearance in reptiles; the first appearance of the fissure of Rollando is in the carnivora.

The significance of various fissures and convolutions in the human brain has been determined mainly by the investigation of the brain in the higher animals, where the brain has same general form as in man. The fissures and convolution-pattern in a certain species of small monkeys show the surface of the hemispheres to be nearly smooth. Between the brain of this monkey species, and that of man, a series of brains show a gradual increase in the number and complexity of the convolutions and fissures of similar types. Thus, the orang-outang, chimpanzee and gorilla have much larger and more numerous fissures than the other species of apes. While the gorilla's brain approaches the human brain more than any of the other apes, it is, however, very much nearer to the apes than to man.

Those areas of the brain whose office is known embrace such functions as are considered primary, common to all animals, and necessary in some way to natural existence. There then remain the unknown regions, the superior development of which distinguishes the human brain, and which may include those functions which place man far above all other animals. The sunken or concealed surface of the brain is twice that of the exposed surface. These fissures or sulci (200 in number) between the convolutions vary much in depth; some are 25 millimeters (1 inch) or more deep, others are shallow; the average is about 10 to 12 millimeters (1-3 to 1-2 inch).

There are considerable variations of the fissures and convolutions on the opposite sides of the same brain, as well as in different persons.

In different regions of the cortex there is much variation in size, form and arrangement of the cells. The most striking differences are seen in the motor cortex of the frontal lobe, which has very large giant cells.

It seems to be generally held (Mingazzini) that the speech area in the third left frontal convolution is liable to be well developed in orators. Thus Gambetta's third left frontal convolution was greatly developed, though his brain was a small one. So, in the case of Professor La Borde and other orators and jurists the speech area was highly developed, but is often very much reduced in deaf and dumb persons.

The author noted a case of a man in the Government

[1] A number of specialists have given various formulas to estimate cranial capacity and brain weight upon the living. Pearl, Todd, Gladstone, in addition to Blakeman, Lee and Pearson, would be useful to consult, as indicated in Literature at the end of this article.

Hospital for the Insane who continually cried out for weeks, "My God." Certain brain cells or brain areas must have been exercised to great excess. There should be a histological study of such cases after death, to determine the effect on the brain. It would be a great discovery to localize the cells affected, which, with all due respect, might be called the "My God" cells or areas of the brain. All cases in which the patient keeps repeating the same words should be studied after death, with a view to cerebral localization.

In man the tumor of the brain can help to show the function of the part of brain where it is; also, if other pathological conditions destroy or affect certain parts of the brain, the functions affected or stopped indicate the office of this part of the brain.

In persons of high intelligence the whole frontal region is generally large. This was especially true of the mathematicians, Wright and Oliver (see table 12). Moreover, in genius in general it is the parietal lobe that seems to be highly developed, as in the chemist, Liebig, and anatomist, Doellinger. So the sight center of great painters was thought to be well developed; thus Raphael's skull was greatly developed in this region. Flechsig compared the brains of distinguished men, and believes that the sensory centers are not directly connected with each other, but indirectly through association areas. Injury and disease in these areas tend to show that the function of these areas is higher intellectual activity. Thus, the frontal area, when injured, causes weakness in attention, in reflection and in control over anger, self appreciation and other personal volitions and emotions. In many cases in which brains of great men have been studied there is complexity, due partly to the greater development of second and tertiary fissures, and partly to the more curved surface of the sulci, especially in the frontal and parietal regions, and there may be even a relationship of a particular type of mind in a special part on the brain. Also, in some great mathematicians the supra-marginal convolution is particularly well developed. In skilled artisans the part of the brain connected with voluntary movements of hands and fingers has been noted in several cases.

Flechsig thinks the posterior area is concerned with experiences founded upon visual and auditory sensations, showing especially musical development. The anterior area, being in closer connection with the body sense area, may be concerned with experiences based upon internal sensations (bodily appetities and desires), and in alterations or defective development of this part of the brain may give a physical explanation of mental or moral degeneracy. Thus, histological studies of the brains of those mentally deficient bear this idea out; here the brain shows a distinct thinning of the cortex, and the maximum focus of this change is found in the prefrontal lobes (anterior association area). In idiots this area distinctly undeveloped, and in the inane the atrophy appears to be marked in proportion to the degrees of dementia.

Demonstration of Cerebral Localization

If the cerebrum in the frog be removed, but care be taken not to interfere with the optic nerves or the thalami, the frog attempts to catch flies and shows other signs of initiative; it will avoid objects. But the cerebrum of the frog is very low in the scale of development compared with the other vertebrates. Thus, in the removal of the cerebrum of the pigeon, leaving the basal nuclei intact, the animal can carry on many coordinate activities; it can stand and perch without difficulty; if placed on its back, it gains its equilibrium at once; if pushed off its perch it flies till it reaches a firm support; if disturbed on its perch it will walk away, showing it can coordinate its leg muscles. If left undisturbed, it will occasionally open its eyes, move its head and pick its feathers. But it spends most of its time sitting quietly as though asleep. If aroused, it shows little or no excitement or fright. At De Boi-Reymond's lecture in Berlin the author saw a pigeon, whose brain had been removed, which did not pay the least attention to light flashed into its eyes, or to the sound of a pistol shot off near it; but when pushed off its perch flew around the lecture room without hitting anything until it fell to the floor exhausted. Results of experiments on rabbits, rats and dogs are somewhat similar. Goltz's dog, without brain, showed complete loss of memory and intelligence, being a mere automaton. Such experiments show what the function of the cerebral cortex is in connection with the mentality of the animal.

The author witnessed another demonstration on a monkey (by Horseley) on the outer surface stimulation of the upper part around the fissure of Rolando, causing movements of the leg; and stimulation of the middle part, causing movements of the arm, and of the lower part, causing face and mouth movements. A lesion in the third frontal convolution on the left side is always associated in man with the loss of the power of speech called motor aphasia; this part is close to the motor center for muscles of tongue and mouth, and is called speech center. In most persons (right handed people) the speech movements are regulated from a particular part of the left hemisphere, the corresponding part of the right hemisphere remaining dormant. When this part of the brain is injured in man there is loss of voluntary speech, the patient cannot utter words at all, or uses the wrong words. With lesion of the posterior part of the first temporal convolution on the left side is associated word deafness. With lesion of the cortex of the hinder part of the parietal lobe (near the visual center) is associated word blindness.

After transection of spinal cord or of brain behind the fore-brain mental actions do not belong to the reactions of the nervous arcs posterior to the transection, but they do accompany the reactions of the nervous arcs in front and still connected with the fore-brain; thus, if the spinal cord is severed, one does not have consciousness of his limbs, whose afferent nerves lie behind the point of spinal severance, but he can see them with his eyes. In the higher animals there is no consciousness in any part of the nervous system from which the fore-brain has been cut off.

Conclusions as to the Brain

These conclusions are based upon the studies of specialistic scientists, most all of whom are recognized as authorities in their lines.

A few of these conclusions may not always be in accord, but this is to be expected in a subject about which comparatively little of a fundamental nature is definitely determined. Yet all general statements concerning a developing subject, which may be, so to speak, four-fifths true, and one-fifth untrue (due to exceptions), are important, because they indicate the trend, or direction, in which to look for future research.

1. From the point of view of nature, the brain is an accidental extension of the spinal cord, and is dependent upon the necessities of the animal in the use of the higher nervous functions. But,

2. From the human point of view, the brain is all important, being the organ of mind, the highest function in man. Yet,

3. According to nature, the extreme end of the frontal lobe (though the seat of the higher mental processes) is the last to be evolved, and the first to undergo dissolution

in mental decadence. And, in consonance with this,

4. The brain in the early stages of evolution was much smaller than the spinal cord, being most subordinate, if not barely existing. But,

5. This accidental character of the brain, as a mere offshoot of the spinal cord, has its parallel in the realm of mind, the furthest development of which is said to consist in philosophical and metaphysical thinking and theories, which are likewise most complicated (like the brain), uncertain and unstable. Briefly,

6. All intellectual activities, being a distinctive expression through the brain as the organ of the mind, are, nevertheless, absolutely dependent upon the brain. Thus,

7. In the higher animals, including man, there is no consciousness in any part of the nervous system from which the fore-brain has been cut off. That is to say,

8. The power of thought is absolutely limited to the fore-brain, which can exist without mind, but no mind can exist without a brain. Thus the subordination of mind in nature's realm is further suggested by the fact that,

9. In the dying hour thought is usually the first to go, while the unconscious organic functions endure until the end.

10. The brain probably reaches its full growth between ages 15 and 20, remaining constant to about age 50, and then gradually becomes less in weight at the rate of about one ounce in ten years.

11. The weight of brain, relative to body weight, is greater in the girl than in the boy, but after the age of 15 the absolute weight of brain is always greater in man than in woman.

12. In the world in general the average weight of the brain varies from 1,350 grams (47 ounces) to 1,450 grams (51 ounces). As smaller men have relatively heavier brains, so women with smaller bodies have larger brains relative to their body weight.

13. Brains under 1,250 grams (44 ounces) are abnormally small and those more than 1,550 grams (55 ounces) are abnormally large.

14. The average maximum brain weight is 1,810 grams (64 ounces) and the average minimum brain weight is 960 grams (34 ounces).

15. Between the ages of 20 and 40 the mean male brain weight is 1,360 grams (48 ounces) and the mean female brain weight is 1,230 grams (43 ounces) and the brain appears to be heaviest between ages 14 and 20. But,

16. At the age of 80 the brain has lost, on an average, 90 grams (3 ounces), except, it has been shown, that in distinguished men the senile decrease in brain weight is delayed about 10 years, as compared with the average man.

17. It has been found that the gray matter constitutes about 54 per cent, the white matter 43 per cent, and the nuclei 3 per cent of the entire cerebrum, and that the weight of the cortex is 33 per cent of the total weight of the brain.

18. The cerebellum, or little brain, weighs 140 grams (5 ounces), about 10 per cent of the entire brain; it averages larger in man than woman, and is relatively larger in adults than children, the converse of the brain.

19. The difference in volume between the inner space of the skull and the volume of the brain is about 7 1-2 per cent, with individual variations from 5 to 10 per cent. This difference changes little in middle life, but after the age of 70 it becomes about 15 per cent instead of 7 1-2 per cent; that is, this difference doubles. So,

20. In a skull with a volume of 1,400 cubic centimeters (85 cubic inches) there is about 100 cubic centimeters (6 cubic inches) of free space outside of the brain, and after the age of 70 this space approaches 200 cubic centimeters (12 cubic inches).

21. The larger the animal, the smaller the relative size of brain, and the smaller the animal, the larger the relative size of brain. This is generally true in man.

22. Brain weight, relative to body weight, is much greater in young animals than when they reach adulthood, which also is true of man.

23. There is a certain parallelism in animals between brain weight and intelligence, notwithstanding variations.

24. The brain weight of the gorilla, though nearest man, is only 416 grams (13 ounces), which is less than one-third of the human brain (1,400 grams = 49 ounces).

25. The higher the mentality of the animal, especially man, the greater is the brain, in comparison with the rest of the cerebro-spinal system.

26. The influence of stature on brain weight extends throughout the animal kingdom in such a way that with equal intelligence small species have a relatively superior brain weight to the large species, and to such a degree that species with very small stature can excel species of very great stature who are much superior in intelligence.

27. The nutrition of the brain seems greatly independent of the general nutrition of the body; thus very delicate children are often well developed cerebrally.

28. The brain receives in superior animals more numerous, various and complex sensations than in inferior animals, and also in taller animals as compared with those small in stature, and

29. As to the motor center, the brain controls less numerous, less various and less complicated movements in the lower species.

30. The surface of the brain relative to its volume is much greater in small than in large mammals.

31. As to the relation of brain weight to intelligence in man, some mathematical specialists claim it is slight. But,

32. Since no human brain in a head less than 11 inches in circumference has been known to function normally, and since no brain weighing less than 32 ounces has been normal, it is evident that size and weight of brain must have very much to do with intelligence within certain limits, and it is difficult to believe that such relationship suddenly stops, for such a saltus is not in accordance with nature.

33. It seems to be generally true that those occupations which require more thinking show heavier brain weight.

34. The most advanced nations appear in general to have superior brain weight. Likewise,

35. Distinguished men, as compared with average persons, have distinctly heavier brains.

36. In 20,000 Washington school children the average head circumference of the bright was larger than in the dull for every age.

37. The great and superior Cro-Magnon race, existing 25,000 or more years ago, shows a higher cranial capacity than other races, and even higher than modern man, indicating that since that time, the human brain has been growing less in weight.

38. The complexity and depth of the convolutions of the brain, indicating area of gray matter, correspond with intelligence.

39. Naturally, skull capacity and brain weight are closely related in about a ratio of 100 to 90. This accords with the fact that the difference between skull capacity and brain volume is 10 to 16 per cent; more means atrophy, less means swelling.

40. Cranial capacity is less in races of small growth, and in the same race is proportional to size of body; but

body size reaches its maximum much sooner than cranial capacity.

41. Cranial capacity may be estimated from its outside measurements almost as well as by direct methods of anthropologists, showing what mathematics can do. Likewise,

42. Brain weight of living persons may be estimated from outside measurements of the head by the following equation:

(Head length—5) × (head breadth—6) × (head height—5) × .000337 + 406.01, which multiplied by .90 gives the brain weight in grams. Thus by this equation

43. Measurements of 89 Members of Congress show their average brain weight to be 1,550 grams (55 ounces), which is very much above that of men in general.

44. To determine the functions of different parts of the brain depends mainly on the investigation of animals. Thus,

45. If the frog's brain be removed, it tries to catch flies, will avoid an object and shows other signs of initiative. Likewise,

46. After the brain of the pigeon is removed it can stand on the perch easily; if placed on its back it rights itself at once. If pushed off its perch, it may fly until exhausted. If left undisturbed it will occasionally open its eyes, move its head and pick its feathers; but it spends most of its time as though asleep.

47. Results of experiments on rabbits, rats and dogs are somewhat similar to the pigeon. One dog with brain removed showed complete loss of memory.

48. In a monkey stimulation of the upper part around the fissure of Rolando causes movements of the leg, of the middle part, causes movements of the arm and of the lower part, movements of face and mouth.

49. While the monkey brain in size approaches the human brain more than the brain of other animals, it is, however, very much nearer to the other animals than to man.

50. Those parts of the brain whose function is known are considered primary, and are common to all animals, and also necessary in some way to their existence. But,

51. There are unknown regions in the brain, the superior development of which places man far above other animals. But, in order to study these parts directly in man human vivisection would be necessary, and it is sometimes performed by nature herself. Thus,

52. If disease, or tumor, affects or stops action of certain parts of the brain, the functions so affected indicate the office of such parts or brain area. So,

53. A lesion in the third left frontal convolution is always associated in man with the loss of speech, being close to the motor center for muscles of the tongue and mouth called the speech center, which has been found well developed in orators, as in Gambetta's brain, though otherwise a small brain. And,

54. The sight center (in occipital lobe) of great painters is thought to be highly developed, as in the case of Rafael's skull in this region.

55. A lesion of the posterior part of the first temporal convolution, on the left side, causes word deafness, and a lesion of the hinder part of the left parietal lobe near the visual center results in word blindness.

56. Some specialists hold that the frontal region, when injured, causes weakness in attention, reflection and lack of control over anger, and also defects in various volitions and emotions. And in general

57. In persons of high intelligence, usually the whole frontal region is large, which is especially true of certain mathematicians' brains which have been studied.

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Heliotherapy in Genito-Urinary Tuberculosis

One hundred and twenty-eight cases of genito-urinary tuberculosis, treated by heliotherapy, are analyzed by W. G. Shultz, Tucson, Ariz. (*Journal A. M. A.*, Dec. 3, 1927). Sixty-four show improvement; in eighteen the condition is stationary; six are worse; five are dead, and thirty-five show clinical cure. The clinical cures are all in the vesical and genital classification, wherein the best results are obtained from this form of treatment. Out of sixty-four genital and sixteen vesical cases, thirty-five are clinical cures, or arrested cases, since they may under adverse circumstances again become active as do pulmonary cases. Of the thirty-seven cases reported in the second classification, twenty-two showed vesical involvement of some degree, and with the exception of two cases, all showed improvement of the vesical symptoms. Two of the patients with tuberculosis terminal showed improvement of frequency and dysuria to such an extent that they were able to double their periods of sleep. Improvement under sunlight therapy is slow at first, and the patients are inclined to become discouraged and wish to hasten their improvement by a rapid increase of the interval of exposure. If furnished a chart on which they must tabulate daily the interval of exposure and note any bad effects, they can be kept more easily within safe bounds, and will manifest more interest in carrying out instructions. Heliotherapy is of definite value in the treatment of genito-urinary tuberculosis, but it may do harm if it is not properly administered. A knowledge of the amount of ultraviolet rays present in the sunlight of the locality in which treatment is being carried out should be of value. Individualization and careful supervision are paramount.

Calcaneal Exostoses or Bone Spurs

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Bony excrescences or exostoses or bone spurs, as they have been variously termed, are a not uncommon cause of talalgia. The presence of these abnormalities is not always suspected and the condition is often misdiagnosed, mistreated or untreated. The pain and the disability entailed by calcaneal spurs has often been mistakenly attributed to rheumatism, to broken arches or to some other obscure foot affection.

Clinicians have underestimated the incidence and the significance of calcaneal spurs and, therefore, the condition has not received adequate study. Blencke[6] examined the unselected foot-roentgenograms of six hundred and seventy-three individuals and found calcaneal spurs in only nineteen cases. Not all patients with talalgia have exostoses. Not all patients with calcaneal exostoses have painful heels; in fact, exostoses may exist without giving any symptoms at any time. "Although calcaneal spur is quite a common abnormality, it is a rare cause for pain"[1]. In some cases, the pain and disability first become manifest after trauma of the heel or foot.

Calcaneal exostoses or spurs are of two types: retro-calcaneal and the sub-cancaneal. Both types may coexist at the same time in the same individual. Exostoses are unilateral or bilateral, are equal or unequal in size. They have been observed at all ages[12], more frequently in males than in females and commonly in corpulent individuals whose occupation requires prolonged standing (cooks, policemen, laundresses, etc.). Their location always corresponds to the site of attachment of important muscles to the os calcis, viz. the tendo Achillis, the abductor hallucis, the flexor brevis digitorum, the abductor digiti quinti muscles and the plantar fascia.

Retro-calcaneal spurs usually originate just in front of or immediately above the insertion of the tendo Achillis and are implanted at different levels of the superior half of the posterior surface of the os calcis.

Sub-calcaneal or plantar spurs more commonly originate from the internal or medial tubercle on the inferior surface of the os calcis. Some of the short muscles of the foot and the dense plantar fascia are attached to this tubercle. In some cases, they originate from the external or lateral tubercle; in others, from the plantar surface of the os calcis in front of the tuberosity.

The term "spur" should more properly be confined to the retro-calcaneal variety of exostoses as the plantar exostosis is usually broad-based, one to three centimeters in diameter, with the crest towards the plantar muscle.

Jacquet appears to have been the first, in 1892, to call attention to the presence of hyperostoses on the posterior surface of the os calcis, i. e., the retro-calcaneal spur. He claimed that as a result of blennorrhagia (gonorrheal), these originated on the bone itself, but he was unable to present any bacteriological evidence of the presence of the gonococcus.

Brackett, Goldthwaite, Painter, Osgood and others reported cases of painful heels with single or multiple exostoses of the posterior surface of the calcaneum. Periostitis and osteo-arthritis were considered by these authors etiological factors. A few clinicians look upon most of these spurs as osteophytic manifestations of a chronic arthritis similar in every way to the "lipping" at the margins of joints.

In 1906 Baer described exostoses on the inferior surface of the os calcis at the attachment of the flexor brevis digitorum muscle.

According to Reclus & Schwartz and others, a few cases are congenital in origin or are developmental anomalies. The exact causative factors of calcaneal spurs are as yet undetermined. We are, however, acquainted with many contributory causes and associated clinical entities that, at times, appear to be direct exciting causes. Infections (gonorrhea, syphilis, etc.), toxaemias (gout, rheumatism, etc.), focal infections (oral, gastro-intestinal and others), apparently play an important etiological role. The successful removal or suppression of these infections, toxaemic states and focal infections has, in some cases, been followed by the subsidence or disappearance of the symptoms caused by the exostoses and in a very few cases, by the disappearance of the exostoses themselves.

Many American authors believe that exostoses result from gonorrheal inflammation. Baer in five of six cases obtained a history of gonorrhea, and although gonorrhea was denied in the sixth case a gonococcus culture was obtained from the heel lesion. In two of Baer's cases, a gonococcus-like organism was obtained from cut sections. Merritt mentions four gonorrheal cases. Moorhead considers gonorrheal periostitis fairly frequent in the calcaneum.

On the other hand, Mapes[8] and others point out that gonorrhea and spurs may be only coincident and that it has never been proved definitely that the Neisserian diplococci are capable of inciting in any anatomic location hypernutrition with consequent exostoses or osseous outgrowths. He further states that there is no recorded instance of exostoses upon the calcar pedis in a female where definite relationship was claimed between it and the Neisserian disease.

Pinard, Toepel, Allender, Swett & Stoll have expressed the opinion that hereditary syphilis plays a part in the development of calcaneal exostoses. They report cases, some with a positive Wassermann, others with a negative Wassermann, in which the exostosal symptoms disappeared under anti-luetic treatment. The great frequency of gonorrhea, of syphilis, of focal infections is noteworthy; equally noteworthy is the relative rarity of calcaneal spurs, and the still greater rarity of painful calcaneal spurs.

In the cases associated with chronic bursitis, be the bursae retro-calcaneal or plantar, authorities disagree as to which of the two conditions, exostosis or chronic bursitis, is primary.

Unquestionably, the most important etiological factor is traumatism, especially occupational traumatism. This is the etiological factor in exostoses observed in corpulent individuals engaged in occupations necessitating long and continuous standing (policemen, cooks, clerks, etc.). The heel bears the greatest portion of body weight in the standing position and receives the heaviest jolting during walking. The violent and often repeated contractions of the foot muscles drag away small fragments of periosteum which later ossify and become exostoses. This does not exclude pathologic exostoses from other causes in the same region.

Many clinicians contend that the collapse of the longitudinal arches of the foot causes increased tension and exaggerated strain upon the musculo-aponeurotic insertions of the plantar fascia, of the flexor brevis digitorum

and abductor hallucis muscles; this irritates the periosteum and gives rise to cartilaginous vegetations which later on calcify. Similar thorn-shaped or prickle-shaped excrescences[3] occur on the humerus, on the ulna and on other bones, also on amputation stumps, probably an ossification in muscle, the result of stripped periosteum.

Structurally, some exostoses are formed by normal adult bone tissue; others show evidence of inflammatory changes. Exostoses never occur in the presence of suppuration[2]. It follows that if a connective tissue be the seat of suppuration, no exostosis will develop. They are of slow development and arise from the periosteum, beginning usually as an acute periostitis which later becomes subacute, then productive and goes through the customary stages of bone production until bone is fully formed. There is at first on account of stimulation by trauma, infection or both a proliferation of the osteogenic layer of the periosteum, followed by partial ossification and finally by complete bone formation with firm attachment to the underlying bony structure.

Retro-calcaneal exostoses are capped by the bursa normally present in front of the tendo Achillis. Not infrequently, plantar exostoses are capped by bursae of new formation. Exostosal bursae often (the retro-calcaneal always) become the seat of an inflammation, chronic in character, and effusion in the bursal cavity and thickening and other degenerative changes in the bursal wall result therefrom.

Exostoses are painful or painless and may long remain undetected and be discovered accidentally during an .r-ray examination of the foot for other causes. No constant relation exists between the size of an exostosis and the pain and disability it produces[11]. In bilateral cases, one foot may present no symptoms, while the exostosis of the opposite foot may be productive of pain and disability[4]. Spurs may exist a long time unbeknown to the patient and become painful following an injury or spontaneously in the course of an infectious disease. In plantar or subcalcaneal exostoses, the dominant symptom is pain, both on walking and when the heel rests on the ground and supports the whole body-weight. These patients shift the body-weight forward to the ball of the foot; they walk on their toes. Palpation may fail to detect the site of the exostosis; though firm pressure upon the exostosis usually elicits great tenderness. Flat foot or pes cavus not infrequently coexists with sub-calcaneal exostosis.

Retro-calcaneal spurs are associated with pain on walking and inability to painlessly dorsiflex the foot. Inspection and palpation reveal a fluctuating mass on both sides of the thickened, widened and slightly displaced tendo Achillis; the exostosis may or may not be felt. Chronic hygroma of the retro-calcaneal bursa is an almost constant accompaniment.

The symptoms above mentioned: swelling, localized tenderness, pain on bearing the body-weight and on walking are suggestive, but to establish a positive indisputable diagnosis a roentgenogram is essential. An exostosis of long standing gives a clear-cut image having the capacity and texture of adult normal bone tissue. If the exostosis be recent, its contour, owing to the lessened calcification, will be less definite, may be blurred. Both feet should be radiographed. Usually, the subcalcaneal spurs project from or are implanted upon the medial calcaneal tubercle; care must be taken not to mistake the shadow of a well developed medial or lateral process of the calcaneal tuberosity for a calcaneal spur[5]. The X-ray enables one to easily and positively differentiate an exostosis from a retro-calcaneal bursitis, a teno-synovitis of the tendo Achillis, an inflammation of the plantar facia, etc. To differentiate from osteoma, one bases himself upon the volume of the tumor. Osteomata show marked bone production without bone destruction and do not invade the tissues but push them aside. Avail yourself of the aid of the pathologist and of the roentgenologist in making your diagnosis.

Successful treatment of the cause and not of the symptom is the prerequisite of permanent and complete cure. If the spur be the resultant of a local cause or causes: a local trauma, a local irritation, a local inflammation and if the associated abnormal local conditions be efficiently treated (flat foot, pes cavus, etc.), the prognosis for permanent cure is excellent after surgical removal of the spur.

Our personal experience leads us to advise with confidence the employment of operative measures in this condition. Kirschner states that orthopedic measures gave relief in only 10 per cent of the cases treated in Gocht's Clinic in Berlin. All other cases had to be operated upon. It must be stated, however, that some operators (Swett & Stoll-9, Meisenbach, etc.) report the recurrence of spurs after operative removal. We never had any recurrences.

Exostosis should be treated, for some time, by non-operative and medicinal measures. If these measures (palliative, protective and medicinal) fail to secure adequate relief, the exostosis, be it retro-calcaneal or sub-calcaneal, is to be removed operatively. To insure completeness and permanency of cure, any coexisting infectious process or toxaemic state should receive appropriate treatment, and all foci of infection should be removed.

Palliative treatment calls for absolute rest of the feet; in cases associated with much pain, immobilization in a plaster of Paris cast is advisable. Sensitiveness due to direct contusion, or bruising of the tissues caused by overuse, must be treated by rest and by change of occupation. After the complete disappearance of pain, the patient is advised to wear high-laced rubber-heeled shoes with felt-pads relieving weight bearing on painful areas. Bradford recommends a shoe with a cushioned heel. A short inner sole is fitted to the shoe with a pad of sponge rubber of sufficient size to cover the striking area of heel. This is cut in such a way so as to leave a hole opposite the region where the bone spur is supposed to exist.

The removal of exostoses necessitates surgical anesthesia: local, regional, spinal or general. Different incisions may be employed to expose the exostosis and the inflamed bursa which frequently accompanies it. A vertical incision over the posterior face of the Achilles tendon enables one to split the tendon, to excise or curette the retro-calcaneal bursa and to remove the exostosis. For simultaneous retro- and sub-calcaneal exostoses a three-segment incision will prove useful, viz. a superior horizontal incision, perpendicular to the posterior face of the Achilles tendon above its insertion; a median incision descending vertically on the internal border of the tendo Achillis and the calcaneum as far as the internal edge of the heel, the incision then becoming again horizontal and antero-posterior.

For plantar exostoses, we have been well pleased with a slightly curved horizontal incision on the inner or outer side of the heel. After division of the skin and subcutaneous cellular tissue, the plantar surface of the calcaneal tuberosity and the muscular and aponeurotic insertions are exposed by careful blunt dissection. The spur is palpated and chiseled away, including its base of implantation. It is important that the entire exostosis be thoroughly removed. Unless this is done, recurrence may occur. Tavernier[10], recently writing on this subject, thinks that not only should the exostosis itself

be removed but also the superficial layer of bone with the muscle layer which is inserted in it. As it is difficult to secure complete hemostasis, drainage for forty-eight hours is advisable. The whole procedure should be attended with minimal operative trauma. The wound is closed with silk-worm gut sutures and a dry dressing is applied. No weight should be worn on the foot until the healing of the soft tissues is complete.

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The Rationale of the Newer Medicine

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(Continued from page 24A, February issue)

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XX

In aqueous solutions or when subjected to the drying effects invoked for the preservation of its supplying foods, cholesterol is rapidly destroyed. It retains its potential when kept in oil. This illumines the reason for and purpose in fat acquirement by certain organic cells, such as vertebral forms. It becomes the basic factor for fat structure holding calcium as a stabilizing agent.

Cholesterol response to the effects of color or chemic rays directs analysis to reasons for pigmentation of the skin and the purpose of deeper colors in racial distinction. Protective coloring media exists for cholesterol preservation and persistence of activity, and for the benefit of a responsive contribution through its effects upon the organic cells. The skin becomes the big reservoir for cholesterol storage and activation.

This is notably apparent in tropic and environmental effects upon those exposed to direct sun rays, or contrarily, the pallor of those who are sun-avoiding and require larger and more responsive areas for light-ray activation. There is also shown the benefit of protecting the external envelope and guarding the potential of this exterior supply and excretory glandular organ. Insulation and protection of cholesterol is as much required as that of other cellular components.

The ionic stability of cholesterol is easily disturbed to the point of non-adaptable application, through over-radiation by ultraviolet rays. This produces inactivation of the monatomic alcohol which is designated as cholesterol. Inertness ensues to cholesterol by over-exposure. This inertness is not remedied by any reexposure of the compound to activating rays. The effect here is not dissimilar to the inactivation of serum when exposed to heat, which destroys its complemental properties.

Prolonged radiation of cholesterol changes its color to yellowish, which is intensified by further exposure to chemic rays. The active, yellow rays of carotin absorb ultraviolet rays, thereby excluding cholesterol activation, when carotin solution contains cholesterol. In consequence, carotin is protected through activation and in turn provides a protection for cholesterol from over-activation, when the latter is in the presence of carotin.

Cholesterol carries no nitrogen in its formula, but shows a decided affinity for nitrogenous compounds, which includes, primarily, lipoids which carry nitrogen.

Cholesterol has a regard for selective association with other compounds. This occurs, as it were, as an interdigitation, through activation and response, creating a democracy in organic representation and conduct.

Outstanding in this association appear the vitamines in various denominations, the three groupings in fat-soluble, water-soluble and antiscorbutic being essential as chemic compounds for cell representation and defense.

Water-soluble vitamine is directly related to anatomic variation, which means calcium affiliation. It interlocks with elements which create structural stability. Deficiency in amount or lowered activity of this vitamine is shown in wasting states and devitalized conditions of the organism.

Fat-soluble vitamine also selects the stabilizing element of calcium as an associate, while the antiscorbutic vitamine patterns the fabric for all vitamine associations, through the promotion of structural adhesion.

Within this fabric, woven by the various factors which create the corporate mass biliary function operates as the process for transforming energy into a form of activity that is available for organic appropriation. The hepatic function is intimately related to the functional activities of the organism. It supplies a reserve, as from a treasure chest, facilitating transportation, providing routes for waste elimination, conserving energy and promoting defense. Upon demand, it rushes reinforcing powers for organic defense, and provides the fuel for energizing functional powers.

A prolonged meat diet increases choleic acid through hepatic activity. Choleic acid is a constituent of bile. It is active in increasing permeability of the intestinal wall, facilitating the admission of peptone, certainly acting as an antigenic power for creating defense through the onset of allergic stimulation. The condition of the choleic acid activity mentioned, opposes the effect that occurs from overfeeding carbohydrates to dogs, wherein amino-acids are decreased and bile acids increased, evidence of the onset of a certain type of allergy.

Subcutaneous injection of peptone, with the administration of bile, renders guinea-pig refractory to anaphylaxis, which does not ensue when extract of cooked liver is used in place of bile. This result adds support to the findings of inactivation of complement ensuing upon the effects of heat.

Bile complement is altered by pathology of the gall bladder, change in the biliary influence being either coincident or quickly ensuing. This proves detrimental to powers of immunization.

The biliary functions are intimately related to blood sfates. Bilirubin which gives the yellow tinge to the blood serum is increased in jaundice and hemolytic diseases. In the latter conditions proportional jaundice does not occur which signifies that a complement occurs to bind bilirubin in some abnormal combination. At the

same time too the lowered resistance to the presence of hypotonic salt solution is readily seen, by the readiness of hemolysis and its evidence that an allergy is present.

Systemic cells are nourished by the same plasma that supports erythrocytes, and require the same attention and support from plasmic conveyance. Organic cells are subject to the same disturbing effects, from mild to extreme degeneration, from the effects of allergy, that erythrocytes show.

Bile presence in the intestine prevents putrefaction, through some complement. Bile in the intestine, in its proper standard of form and potential, activates duodenal and intestinal enzymes, acting to increase lubrication of the intestine and prevent coagulation of mucine.

With insufficient supply of bile to the intestine, mucine lessens but mucus collects to institute catarrhal conditions. Colitis follows, the trend being toward ulceration, with atrophy of the villi. Allergy with cellular degeneration occurs at times in remote structure, is an evidence of altered complement for holding calcium with ionic power.

The effect of the liver function in stabilizing erythrocytic balance through plasmic influence is very apparent, as shown by the fragility of red cells in hemolytic jaundice. This affect is similarly shown in the endothelial cells of small blood vessels, wherein the lipoids from biliary and splenic supply show alteration. Related to this is the disposition of treponema in capillary walls. This organism, in the human species, is associated with effects upon and counter-effects from the biliary secretion.

Polymorphonuclear cells are unable to digest treponema, but lymphocytes and other cells of intimate kin, and of plasmic conveyance, are the principal factors of phagocytic activity through the influence of bile.

If vitamine A exists, which has been doubted, it must have an individual identity. It must exist in great abundance in the lipoids of the liver and pancreatic gland, being closely associated with conditions which are related to or constitute pernicious anemia.

Metabolism in the liver is increased by administering cod-liver oil. This is related to the vitamine known as A. Elaboration of this vitamine is, to a great extent, produced by chlorophyl activity in sea weeds. This may account for the large amount of the vitamine in cod-liver oil. Animals, and man, have the privilege of drawing upon the storage of this vitamine in the organic reserve, when depleted diet occurs.

Teige expressed a belief that vitamine A is a ferment, active in producing urea from ammonia and carbon dioxide. He expressed the idea that an increased amount of ammonia and amins occurs in the blood in avitaminosis, and disturbs calcic metabolism.

Heart response is noticeably affected by biliary secretion. Administration of a sufficient amount of camphor inhibits or depresses cardiac response. When bile administration precedes camphor, a lowering of surface tension occurs and the heart muscle is stimulated to activity. This may tend to the restoration of ventricular contraction stopped by chloroform anesthesia.

The defensive reaction of the organic cell is therapeutic. This measure affects adaptation to environment. For protection, the cells use natural and composite therapy, thus directing a variety of functional responses in attack and defense.

Within the index of natural specific methods for protection of the human cell are included opsonins, organic secretions, autocoids, hormones, chalones, lipoids, cholesterin, allergic stimulation, protein sensitization and immunizing processes arising in other provisions.

Natural routes of election for therapeutic government of cellular states furnish the best examples for instituting remedial benefits. Patterning after organic methods should serve to guide those whose best ideals and efforts are devoted to the preservation of the health of mankind. This determines a method for idealistic results, and restoration of normality, when cellular impairment occurs.

XXI

The vertebral organism adapts its habits and reactions to conditions created by environment. In the main, radio-active, thermic, climatic, atmospheric and dietary influences constitute the activities which govern organic reactions. These provisions must be solicited and employed to evoke the activating benefits that are required for corporal needs.

Two distinctive requirements attend the rôle selected by the organic cell. These are, demand for solubility as supplied by water, and essential nourishment, as exists in food elements.

For the moment, it is of less concern to consider the basic factors which enter into activation of these needs, which are fundamentals for promoting existence.

In reality, the three general food types, proteid, fat and carbohydrate, have little specific identity. Each is intimately related to the others, and each type designates a stage of attainment through transitional development of organic forms, based upon identical and kindred elements. Non-distinctive, these types represent composite structures of varying complexity, in mixtures or combinations of certain co-ordinating elements.

The objective in and effect of animal digestion is the reconversion of food products into soluble, component fractions, as amino-acids. The derived products are then equipped with lipoids or other activating substances, to be rendered available for the needs of the organic cell, which could not otherwise utilize them. Through this provision, the animal cell is empowered to convert latent into active energy, for organic expression.

The term kinetic connotes a hypothetic substance, supposed to excite amoebic movement in leucocytes. The kinetic system employed by the organic cell represents latent energy transformed into heat and motion, through the assistance of static poise and equilibrium. This constitutes the dynamic power of the organic cell.

Amino-acids are fundamental requirements for forming protein. They enter into all synthetic construction of essential organic compounds. Amino-acids also have a relative influence upon, or enter into the construction of, fats and carbohydrates as well as proteins.

Before any proteid can be used, it must be split into its composing amino-acids, which, when reassembled, give identity to proteid form.

Proteids vary in their amino-acids. Some proteids have considerable amounts of these units, other proteids are impoverished through their deficience. With too little of the required amount of amino-acids in proteid supply, the deficience must be remedied by proportional increase in the defective proteid, or the amount of required amino-acids must be contributed from other sources.

Amino-acids must be properly released and prepared by the digestive system for subsequent absorption and synthetic construction into tissue. Otherwise, the excess in elaboration or defection in type becomes loaded as a useless cargo upon the defensive, metabolic activity of plasma.

Only certain amino-acids can be utilized in the fabrication of the human vertebral type. The excess supply can only be wasted when not set aside in reserve, the

waste being directed through some harmless synthesis.

Much of the effort of the cell cluster is directed to rendering absorbed products impotent for endangering the organic association.

Certain amino-acids cannot be synthetized by the organic system of man. These must be supplied from extraneous sources, as dietary forms, or re-utilized from endogenous combinations, as in the absorption of wasting forms, effected through the function of renal tubules. This follows the splitting of proteids for discharge, with reassembly of salvaged elements and structures, among which may be recognized certain amino-acids which are useful to and kindred with organic proteids.

About eighteen amino-acids are known. Of these, cystin, leucin and tryptophan are necessary to the cellular association of man. The absence of any one of these is indicated by an abnormal condition; for instance, absence of tryptophan creates emaciation which progresses to death.

XXII

Animal proteid is reserved for the display of function. Amino-acids required for this performance must be specific in structure and nature.

Functional service of proteid includes the formation and repair of tissue. For this purpose, protein is protected by the activities of fats and carbohydrates.

Man is the result of the adaptation of certain organic groupings, definite in mass and expressing certain fundamental responses. This aggregation is by formula, based upon certain amino-acid combinations, being in a state of responsive affiliation with certain influences which attend vital existence.

Oxidation of protein furnishes organic activity. This oxidation is intolerant of impairment of its activating gas, by dilution of its pressure beyond permissable bounds, or by its essential activation being fettered through certain fixative associations, as in carbon monoxide.

Specific dynamics which attend the activity of proteid show that amino-acid compounds have greater power for producing animal heat than either fats or carbohydrates possess, for proteids fortify against the effects of cold.

The great value in protein is found in its response to requirement for cellular adaptation, which creates the utilization of proteid by organic cells.

With fat supply unmolested for providing energy, and proteid readily responding through its feature of solubility, amino-acids become readily adapted to supply carbohydrate effects, and may thus augment organic energy.

Muscles are readily consumed for creation of energy. Developed through activity, muscles soften and shrink through disuse. Amino-acids, released by this process, are used for other systemic requirements, being stored in the media of various organs, glands or related forms, with wastage of nitrogen, when in excess of organic need.

Released from storage, upon call, amino-acid may be transformed into compounds related to proteid, as amino-sugars. Glusamin is of this type, probably representing a transitional form of amino-acid, easily converting into carbohydrate assembly.

Glyco-protein and gluco-protein represent a group of protein-carbohydrate compounds, called conjugate proteins. Lecitho-protein and other members of this type are derived through processes of hydrolysis.

Glycosamine, a glucose type, contains nitrogen, and occurs in keratoid combinations, as noted in albuminoids, or as found in the pleura and nail structure.

Gelatine, another proteid type, cannot restore vertebral structure, because of its deficience in the essential amino-acids of tryptophan, tyrosin and lysin.

The dietary dangers of proteid do not reside in a high protein content from acceptable amino-acids, but in indirect errors of proteid instigation. These dangers may occur through the presence of unrelated or defective forms of amino-acids for which the organism has not developed sufficient tolerance or immunity. Conditions may be produced which closely partake of the effects attending transfusion of unlike blood types, creating allergy. With less intensive allergic effects, reactions occur as in minor sensitivity.

Supply of proteid in diet finds certain proteins, as cover proteins of legumes, may especially cause grief for the organic cell of man. For instance, zein, a proteid of maize, is deficient in tryptophan and lysin, and gliadin, a proteid of wheat, contains an excess of glutaminic acid, but is deficient in lysin.

Milk and meat have high values in essential amino-acids for synthetic structure of body cells. These prove far superior to the proteids of corn, wheat, beans and other food articles so abundant in animal diet. Contrarily, however, milk proteid supplies amines in excess, easily provoking toxicity for the systemic assembly of man. Herein is shown disparity in proteid forms required by, and their effects upon, embryonal forms, as compared with maturer types of growth of mankind.

Bacteria oxidize nitrogen for energy needs, also requiring hydrogen and inorganic salts to duplicate this need of structural cells of man.

The allergic effects of bacteria upon the cells of man can only be a reprisal for the effect of the latter upon bacterial protein.

The requirement for amino-acids and ammonia salts by pathogenic bacteria shows that these, like the cells of man which are subject to bacterial attack, solicit related forms of nitrogen. This is further identified in the faculty possessed by certain bacteria for converting protein to sugar.

A direct proteid effect occurs in cystinuria, which depends upon the amount of protein ingested, and its final disposition by function. Cystin is a proteid carrying a large amount of amino-acids combined with sulphur. In such way it shows relation to the disposition of indican. Cystin calculi appear in showers after periods of high protein digestion, cystinuria representing a condition of minimal protein catabolism. Excluding protein from the diet does not clear the urine of cystin, but altering the plasmic concentration, as in the administration of sodium bicarbonate, corrects malactivation in part, increasing elimination of cystin, and exposing cystinuria as an allergis manifestation, with relation to misdirection of normal metabolic efforts.

XXIII

Curtis and Brown disagree with the theory that protein anaphylaxis requires preliminary sensitization. They deemed metabolism inadequate for nitrogenous needs in those individuals who are sensitive to protein. They also expressed the belief that this lack of protection is an inheritance, being increased by dangers which are involved in errors in diet.

Proteid value depends upon the kind and quantity of amino-acids present, hence improper amino-acids may act as antigens. Many substances act as antigens, but, in the main, man finds most of his allergic onset arising from protein sources.

The proteid molecule acted upon by digestive ferments is rapidly carried beyond the peptone stage, to non-toxic amino-acid forms. This attends any digestion of bacterial proteid within the intestine, where, normally, only

non-toxic proteids undergo absorption. Far different, however, is the condition when erroneous digestive conditions exist, or when parenteral digestion ensues from introduction of proteid into the system through unprotected routes.

Antigen is a provoking factor for chemic and physical display. Each protein has a different effect upon the organism from any other protein, and each has a different antibody.

Traumatized cells are subject to lytic solution. This is the same effect that is attempted by bacterial onslaught upon organic cells. Symptoms that ensue through allergic display only occur after cell degeneration has been already launched.

Loew deemed that a difference in effect attended in the alteration of the living and dead proteid forms that he studied. He saw a liability of aldehyde groups forming in the change of living structure. Aldehyde represents a sub-oxidation, too little oxygen for acid, insufficient hydrogen for an alcohol, and in consequence it is an intermediate product.

Loew believed that certain substances ignore inactive proteids, to destroy instead living cells. He considered that reactive, changing proteids arise through the concentrating activity of an unknown aldehyde of asparaginic acid. This is a protein cleavage product. Loew showed that microscopically a peculiar protein existed in vegetable cells, between labile or responsive and stabile or reserve proteins. This must, of course, direct the attention to ionic manifestation or activation of proteid.

To render an atom inert or neutral, electrically, the sum of the negative electrons must equal the sum of the positive electrons inherent in the nucleus. With disassociation or removal of the negative electrons, the nuclear charge preponderates, with a positive activity. Upon the contrary, when the negative electrons accumulate, the atom becomes negative in its action.

Ionic display occurs in the splitting of molecular form into atom groups with preponderance of positive or negative effect.

The locomotion or activity of split molecular products, or in the case of proteids, of amino-acid activity then, depends upon the concentration toward the positive or negative preponderance. This effect upon molecular response, locomotion or reaction, designates the activation which ensues in any organic substance affected. This signifies the chemic and physical display that occurs in organic and allergic effects.

Allergy involves biology, representing chemic influence, and includes the effects of pharmacology. Allergic effects represents alteration of cellular function. Allergy includes the alteration of activation of blood proteins, bringing about general systemic influence thereby.

Manifestation of allergic effects is revealed through the influence of the nervous system. This is effected through elaboration of certain products and their transmission to alter the plasmic concentration in cell structure.

Adjustment of proteid compounds occurs in health as evidence of adaptation to environment and response to development of organic growth, an evolutionary progression. Normally, prevention of harm from products undergoing absorption or subsequent alteration accompanies proteid change. When dereliction occurs in this effort, pathology is initiated.

Proteid becomes toxic from some other reason than exists in itself. It is the split products of proteid that produce pathology. Toxicity begins in digestive alteration or lytic change. This institutes allergic effect.

Allergy is hypersensitiveness, being a natural, inherited, functional expression.

Recently, allergy has been confined to responses attendant upon the human body alone; however, protein effects are practically identical in character, in man and animals, regardless of the proteid type used.

Reaction to allergic effects rests upon the common basis of disturbance of the physical and chemic mechanisms of blood and tissue.

Organic utilization of proteid is never complete, varying in accordance with the type of food supply. Through incomplete servicing of proteid supply, a ready occasion for allergic effect arises.

Enteric digestion of proteid, not in excess of capacity for organic response, normally produces no systemic poisoning, because local immunity and prophylactic defense is provided in a properly defending complement. This inactivates the antigen or toxic archon which occurs in amino-acid release. The proteid molecule that is freed by defensive ferments rapidly passes through the peptone stage to non-toxic amino-acids.

When the bacterial cell undergoes digestion, as in the enteric canal, it passes through the poisonous stage by effect of complemental binding. The non-poisonous residue is easily wasted or becomes transformed into an acceptable proteid form. This is the ideal form for digestive conduct.

Much allergic stimulation occurs through the oral route, as a result of absorption of antigens. Allergic offense and defense are in part transferable through the nurse from mother to infant.

As a source of allergic response, antigen is a provoking factor for chemic and physical change.

Disparity in the amount of intake and output of nitrogen furnishes the key to proteid effects. The child normally has less nitrogen output than intake, accounted for in the reservation of nitrogen for growth pnrposes, but the maturer organism balances nitrogen excretion with intake.

The nitrogenous process of the organic cell is revealed as an activation of acceptable protein, with the nitrogen bound or inactivated to undergo elimination. Allergic manifestation ensues upon any alteration in this direct procedure.

Absorption of dead or injured cells or introduced organic material occurs principally through lytic solution. This illustrates the method for inactivating nitrogen, for the purpose of excretion.

The normal cellular defense of man has in view the minimization of detriment from proteid. This is attendant upon proteid attack and any change which proteid undergoes in the organic system. The effectiveness of defense is measured by the antagonism to allergic shock. This activity is directed to the control of blood changes in excess of permitted boundaries.

In the exposure of traumatized cells to lytic solution, there is expressed the same effect that attends the lysis of bacteria, upon assaulting organic cells. Lysis releases the proteid nucleus, regardless of the allergic incidence. Symptoms that ensue occur only after cell degeneration has been already instituted.

XXIV

The powers of cholin, lecithin, bilirubin, lipoids, cholesterol and other defensive agents are directed to the preservation of the blood or plasmic concentration. This must be of specific reaction, as representing the concentration to which the normal vertebral organism is adapted. It is by such properties of cellular association that control of allergic production is effected. These active agents serve as buffers to absorb the shock of histamin attack or other similar onslaught, as directed, for instance, to the production of hemagglutination. The direct effect of allergic attack is devoted to an initial

alteration of blood proteins, always altered in disease states.

Many proteins normally exist in the blood stream. A constant activity is expressed in plasmic response for adapting blood proteins to a standard in ionic concentration, which must exist throughout the cellular grouping.

A higher percentage of platelets and bilirubin occurs in the splenic vein than elsewhere. This is the evidence of lipoidal and complemental properties existing here in larger ratio than normally occurs in other localities.

Effects upon proteid arise through splenic influence. The spleen is accredited with control of the physical metabolic rate. Splenic activity is shown by various functional responses. It is accredited with furnishing a hormone for destroying defective erythrocytes, activating biliary function, and stimulating erythrocytic formation from bone marrow. To this generalized activity has been added a production of endotheliocytes and lymphocytes, of quite specific properties.

If but part of this compounded, functional activity is actual, it serves sufficiently to prove the contention that the effect of functional operation in the vertebral cell is founded upon the induction of allergic expression.

Cellular use of the response termed allergy creates the stimulus and elicits reaction in associated cells, as a natural, functional process.

Allergic stimulation answers to a normal expression for maintaining organic existence. Like light, heat or other energetic manifestation, when under control, proving of useful service, so also is the benefit in allergy. Through this phenomenon the cell expresses its demand for and creates co-operative attention in and activation of associated cells. This is communicated through plasmic circulation within cell substance, for each cell has an individual intralocular plasmic supply. Allergic effects are communicated to structural cells, through the media of the blood plasma, being proportional to organic control or uncontrol of the inciting influence.

The erythrocytes are regarded as particularly active in response to allergic effects, in especial to that of lytic solution.

Mayo mentioned that erythrocytes, as a result of development, are probably active by being descendants of the white cells. He called attention to invertebrate blood and the first embryonic blood being white, to leukemia with high white cell count, and to reduction of splenic size with diminishment of high white cell ratio by X-ray activation.

To this may be added evidence in the constant shift of the leucocyte count and white cell increase for defensive purposes. Higher ratio of white cells occurs after proteid than after fat or carbohydrate intake. In the existence of this latter fact is shown the greater requirement for proteid-splitting factors than for other blood alterants. So highly has the faculty for proteid alteration been developed in the animal organism, as man, that parenteral entrance of proteid creates immediate activation of proteolytic agents. The excess in amino-acid forms, derived through supply from such source, creates progressive cell change of degenerative type, interrupted only by control periods marked by lessened proteid absorption.

The blood is the great mart for cellular exchange, a highway for metabolic traverse and chemic display. Surcharged with secretions and ferments of organic production, the plasma is shown as the medium for glandular activity. In essential the blood proteins are immediately involved in any allergic production.

In weakened or poorly resistant individuals, processes for converting proteid supply into harmless products are at a minimum, and, in consequence, severe effects occur.

Man is deemed the most resistant of animals to the effects of allergic stimulation. This has only resulted through his greater exposure to the effects of allergic development with survival of the type that he represents. Through extensive employment of allergic benefits, man has attained his throne of rational domination over brute types. All benefits that pertain to the genus homo, to his faculties, subtle powers of thought, his creative instinct and idealism, hinge upon the utilization of energetic powers and specific properties which exist in allergic stimulation. Through this employment there has been a generation of organic response, both physical and corporeal.

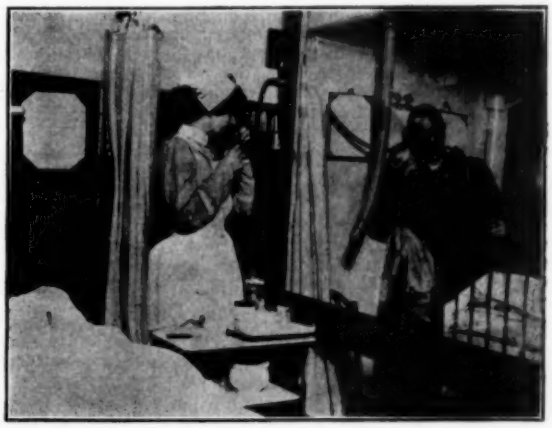
Multitudinous are the environmental sources for allergic effects. These arise in all exposure and associations of the cell. Among these sources are the habits, foods, examples, suggestions, repetitive rote, and every day existence effects of life. Particularly effective in directing the influences for cell response are the very common parenteral entrances of proteid forms, and the constant enteric absorption in food supply.

These are factors to be very definitely appreciated, but effects remoter and more subtle in their influence create allergic effects and initiate allergic responses.

The impingement of sound upon the delicate aural apparatus, with associated response, the piercing of the retinal cell by the light ray, or the irritation of the delicate mucoid cell by aromatic stimulus, but illustrate certain sensory responses to allergic effects.

So has development attended and led onward the march to higher types, through the dominant factors of nitrogen activation, in proteid forms.

(To be continued)



Not a Curio—Just a Patient

In Guy's Hospital, London, a special glass case has been put in the bronchitis ward for the treatment of that type patient. The glass case is air tight, and the patient lives inside, where he breathes double the amount of Oxygen found in normal atmosphere. This Oxygen is forced in, and it is said that the patients declare themselves to be walking on air, so good do they feel. Photo shows a nurse asking the patient how he feels, through the special speaking tube.

Gonorrheal Arthritis

In the experience of B. A. Thomas, Philadelphia (*Journal A. M. A.*, Dec. 24, 1927), gonorrheal arthritis has been polyarticular in 58 per cent and monarticular in 42 per cent of cases. The involved joints in their order of frequency have been: knee, 58; ankle, 50; hip, 32; wrist, 21; shoulder, 19; phalangeal, 17; elbow, 13; metatarsophalangeal, 8; spine, 8; metacarpophalangeal, 7; sacro-iliac, 1; temporomaxillary, 1; sternoclavicular, 1.

Correspondence

Urology in 1927

To the Editor of THE MEDICAL TIMES:

In the review entitled "Urology in 1927" by Dr. Pedersen, appearing in the January issue of THE MEDICAL TIMES, I happened to run across the following statement in the second paragraph on page 10 relative to experimental methods of testing urinary antiseptics, with special reference to hexylresorcinol:

> "It has always seemed to me that all these new drugs should be added to normal urine in vitro in various strengths and then cultures of organisms put into the urine."

I would like to call attention to the fact in this connection that exactly this procedure was carried out with hexylresorcinol in my original studies on this synthetic substance, the results of the experiments being first described in the first article I ever published on the subject, namely, in the *Journal of the American Medical Association*, December 20, 1924, volume 83, page 2005. In fact the results of these experiments in which it was found that crystalline hexylresorcinol dissolved in human urine would destroy organisms added to the solution in extremely high dilutions and regardless of the reaction of the urine led me to continue investigations with hexylresorcinol as an internal urinary antiseptic. I am enclosing a marked reprint of the work in question.

Sincerely yours,
VEADER LEONARD, M. D.

Baltimore, Md., January 14, 1928.

By Dr. V. C. Pedersen:

In my article "Urology in 1927" which appeared in the MEDICAL TIMES, January, 1928, I made a comment upon the abstract of Dr. V. Leonard's paper, which appeared in the *Journal of the American Medical Association* for August 13, 1927, on the subject of diuresis *vs.* antisepsis in the treatment of urinary infections. In this comment I advanced my belief that all new drugs should be tested by adding them directly to normal urine *in vitro*, in various strengths, with the further addition of cultures of organisms. Nothing is said to the effect that such tests had not been made by Dr. Leonard and others.

Dr. Leonard, however, wrote to the MEDICAL TIMES to the effect that in the case of hexylresorcinol he had made tests of this character, the results of which has been published in his original report on this drug, which had been published in the *Journal of the American Medical Association* for Dec. 20, 1924. The crystallized salt had been dissolved in human urine and even in extremely high dillutions and regardless of the reaction, organisms had been destroyed. In fact it was as the result of such tests that Dr. Leonard had been induced to continue the study of hexylresorcinol as a urinary antiseptic.

Dr. Leonard mailed to the editor of the MEDICAL TIMES a marked copy of a reprint of this article, in which, on page 8, is to be found a concise account of the bactericidal power of the salt in question. The organisms tested were the B. coli and the staphylococcus albus. There had been two exposures, of one hour and twenty-four hours respectively, in urine of both acid and alkaline reaction, and always freshly voided. Concentrations of the salt varied from a low one of 1 in 70000 to a high one of 1 in 10000 and control tests were made with plain water. Positive results alone are published.

In the case of the bacillus coli the salt destroyed the organism in a concentration of 1 to 10000 in one hour and the same strength in acid urine was required in a twenty-four-hour exposure. In the case of the staphylococcus albus, weaker solutions sufficed, especially in the twenty-four-hour exposures. Both strains of germs tested were obtained originally from cases of pyelitis.

In alkaline urines prolonged exposures required lower concentrations than short ones. Thus 1 to 10000 sufficed for exposures of one hour for destruction of the bacillus coli, while in exposures of twenty-four hours 1 to 18000 was sufficient. For the staphylococcus albus in alkaline urine 1 to 60000 sufficed for twenty-four-hour exposures while in the short exposure 1 to 18000 was necessary (question mark after this figure).

Tests made for control with plain water show that the drug in question is more highly bactericidal in this medium than in either acid or alkaline medium.

It thus appears that Dr. Leonard followed the requirements I suggested in a most painstaking manner. But it does not appear that I had reflected in any way on Dr. Leonard for I merely suggest that *all* new drugs (put forward as urinary antiseptics) should be submitted to these tests *in vitro*. Inasmuch as the context might suggest that Dr. Leonard had not made such tests it is certainly due to him to make a statement to the contrary with citation of documents or at least of references to the report in question.

It is to be regretted that all authors in continuing a study do not connect all the steps from one contribution to the next. One clear brief paragraph will always do it.

The situation somewhat parallels an experience of my own. Many years ago I brought out a study showing suggestively if not conclusively that in the phenolsulphophthalein test the loss between 100% injected and 80 to 85% extreme maximum observed is due to color absorption strictly along the line of artists blending colors. Urines, yellow and orange dyes were taken and mixed with phthelein and according to the concentration used, a color loss varying from 20% in concentrations to 5% in dilutions was easily demonstrated. Although the blending of colors is familiar such as green produced by mixing yellow and blue, two observers in experiments of their own totally missed the point and uttered a mistaken paragraph adverse to this work. The fact was obvious that they simply didn't understand the principle at stake and criticised not their own misunderstanding but the report published.

In this instance of the work of Dr. Leanard, I am very glad indeed to make clear that I was laying down a general principle and not uttering an adverse criticism.

Re The Weekly Bulletin

To the Editor of THE MEDICAL TIMES:

I would deem it of great assistance if you would call the attention of all your readers to a matter which may be of serious moment if they fail for any reason to give it prompt attention. The City Record may curtail the number of copies of the Weekly Bulletin that we regularly issue, if physicians fail to indicate their interest. Will you therefore please advise your readers of the following:

In a few weeks each reader of the Weekly Bulletin issued by the Department of Health will receive a communication requiring a reply as to whether or not such reader wishes to continue to receive this publication. The Board of City Record will send this letter out in order that it may discover whether there is justification for maintaining our present mailing list. Please do not fail to reply to the letter that you receive so that we may know to what extent the Weekly Bulletin, even in its present abbreviated form, meets the need of physicians, of public health workers and others, and so that we may not through your neglect to answer suffer a reduction in the number of printed copies allowed by the Board of City Record, if the publication is of value to you.

Once again, therefore, you are urged to bear this in mind and to promptly reply to the proposed inquiry indicating whether you wish your name to be retained on our mailing list.

Very truly yours,
LOUIS I. HARRIS, Dr. P.H., M.D.,
Commissioner Department of Health,
City of New York.

January 25th, 1928.

Annual Hospital Clinical Congress of North America

The 13th Annual Convention of the Catholic Hospital Association of the United States and Canada and the Second Annual Hospital Clinical Congress of North America will be held in the Cincinnati Music Hall, Cincinnati, Ohio, June 18th to 22nd, inclusive, 1928. The Fourth Annual Convention of the International Guild of Nurses will be held at the same time, in the same building, at night meetings.

This Convention and Congress will be one of the largest and most important hospital meetings of the year, and will comprise general scientific meetings, special clinics or demonstrations of hospital departments, and three hundred special commercial and educational exhibits. Outstanding authorities in medicine, surgery, pathology, nursing, dietetics and hospital administration, architecture and engineering will lecture and demonstrate in specially planned clinics representing the various departments of the modern hospital. A professional program of the highest interest and value is now being formulated, and all persons interested in medical and hospital service are cordially invited to attend. Further information may be obtained from John R. Hughes, M.D., Dean of the College of Hospital Administration, Marquette University, Milwaukee, Wisconsin, who is General Chairman of the Convention and Congress.

"Abdominal Pain of Throat Infections in Children," and Appendicitis

Joseph Brennemann, Chicago (*Journal A. M. A.*, Dec. 24, 1927), is convinced that many cases of appendicitis in children occur during, and as a complication of, or a sequel to, an infection in the throat. Of thirty-five cases of appendicitis in which operation has been performed, 17 per cent unquestionably occurred during the course of very evident throat infections. At least an equal number were suggestive.

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NEW YORK, MARCH, 1928

Tell it Not to Rotarians, Publish It Not in the Chambers of Commerce

Republics are proverbially ungrateful, while some communities are seemingly unaware that they have harbored men like gods. This is passing strange when one considers the paucity of extremely great figures.

A striking exemplification of such apparent unawareness is furnished by the fact that a man of stupendous, universal and indeed eternal significance in thought and achievement received the most important part of his training in Brooklyn with no attestation of such a fact by memorials—that is, distinctive memorials. The portrait of Whitman that hangs in the Eagle Building (Whitman was editor of the *Eagle*) can hardly be denominated a distinctive memorial in the sense in which we are using the term. Three of the places where he resided are known to his admirers, yet not one bears a memorial. And this despite the fine studies of Whitman by Cleveland Rodgers and Emory Holloway, both Brooklyn men. Of such matters the Babbitts seemingly know nothing.

Thus one may say of Whitman as was said of Saul:

> The beauty of Israel is slain upon thy high places: how are the mighty fallen! Tell it not in Gath, publish it not in the streets of Askelon; lest the daughters of the Philistines rejoice . . . For there the shield of the mighty is vilely cast away, the shield of Saul, as though he had not been anointed with oil.

For another phase of civilization and culture the Babbitts care nothing. It is exclusively to the high honor and credit of the Association of Ex-Internes of the Kings County Hospital that it has not failed to commemorate most fittingly a physician whose greatness can only be measured by comparing him with Jenner (if not with the gods), one whose stature in the annals of medical science is colossal, indeed of heroic proportions. We mean Walter Reed, who was an interne in the Kings County Hospital (and in the Brooklyn Hospital) in 1871, and afterward a practitioner in Brooklyn and an inspector for its Board of Health. On the walls of the Kings County Hospital is a memorial tablet setting forth in glowing words the fact that this veritable Olympian received his training there. What an inspiration such a tangible recognition of the fact of Reed's residence and service must be to young men following in his footsteps, and what glory it reflects upon the institution that prepared such a modern Hercules for practice and high achievement. Moreover, what irony there is in such a memorial considered as a foil to the tablets, conspicuous on every hand in our hospitals, commemorating whole hordes of Babbitts.

Whitman and Reed! "They were swifter than eagles, they were stronger than lions." In these, its children in a peculiar sense, Brooklyn possesses a distinction that ranks it with the cities that nurtured a Chaucer and a Vesalius, however commonplace the town may seem to commonplace men. Its soil looks like any other, but it is sacred. It appears to be a Babbitt warren, and it is Periclean Athens. It masquerades as an obscure borough, and behold, it is Parnassus!

Gulliver in the Subway

During the rush hours in the New York subways one thinks of crowded cattle in transit. But there is a great fault in this manner of thinking, for *cattle are not crowded in transit*. The greatest consideration is given to cattle, hogs and other animals with respect to space and the provisions of the law appertaining thereto are strictly enforced.

Bulletin No. 589 of the Bureau of Animal Industry of the United States Department of Agriculture states that "It is permitted by the law [the so-called 28-hour law, approved on June 29, 1906] to transport animals without unloading [for rest, etc.], provided they are carried in cars in which . . . sufficient space is provided for all the animals to lie down at the same time." The main purpose of the statute is, obviously, "to prevent cruelty to animals while in the course of transportation."

It seems clear enough that the provision of floor space sufficient to permit all the animals to lie down at once would be fairly matched in the case of human transportation by provision of sitting space sufficient to permit all the occupants of a subway car to be comfortable.

It may be argued that the animals have to make rather lengthy journeys, while the wretched subway traveler is not packed into his moving cellar for long periods. But the hog makes perhaps only one journey during his lifetime, whereas the human victim of our social shambles spends on an average about one year of his productive life in the subway.

Here is something that stinks to heaven and we have no Swift.

A Suggestion for the Reduction of Automobile Accidents

According to press reports the Legislature may introduce a measure providing for compulsory automobile insurance against injuries and death resulting from accidents. The revenue derived in this way would be great enough to enable the State to remit the annual registration tax on vehicles with a "clean bill of health" as regards such accidents, or to accept the tax and then

pay a bonus equivalent to it in amount, or to deduct a percentage of the insurance premium approximately equivalent to (or perhaps considerably larger than) the vehicular tax. By a "clean bill of health" is meant either entire freedom from accidents, or lack of liability where accidents have occurred in the course of the year. A suitable car emblem might also be issued annually to those meeting the test successfully, or the State might sanction the issuance of such emblems by accredited bodies interested in accident prevention.

Certain transportation lines have reduced accidents materially by paying bonuses to the men operating trolley cars for stated periods without maiming or killing anybody, and the suggestion of the writer is based upon this experience.

Not only would the insurance revenues be large, as noted, but any reduction of accidents through the method suggested would inure to the conservation of the State's funds.

Rural Parallels

In reading the General Church Program (1926-7-8) of the Protestant Episcopal Church one is struck by the similarity of the rural problems of medicine and of the Church.

"Rural America is to-day not Christian. Accurate investigation has disclosed that only one out of five of the people in rural districts attend Church services. There are 4,000,000 country children that do not go to Sunday school."

We may echo this with the declaration that the medical needs of rural America to-day are not properly served. There is twice the danger of childbirth for the country as against the city mother, and every baby born in the country has only one-fourth the chance to live to be one month old, that the city-slum child has.

We fancy that the problem of the Church as regards theological quackery in the country tends to parallel in seriousness that of medical quackery in rural districts.

Medicine in America, like the Church, is urban in its tendencies. Both think mostly in terms of the city.

How well the parallel works out: "Few men in the ministry to-day can recall having rural work presented to them as a vocation during their seminary training. Fewer still have received, through the Church, a specialized training that would fit them better to meet the difficult task of leadership in community service—a leadership that is considered essential if the Church is to win a place in rural communities."

Lectures are now given in rural work at three of the Protestant Episcopal Church's seminaries, and at two of the larger seminaries a plan is being developed whereby the students are given opportunities to work in nearby rural parishes under competent supervision. Do our medical schools offer anything comparable to this?

The Program remarks further: "And yet the country life of America must be maintained; and that, not by the less fit, but by the soundest of American stock. Surely the task before the Church is a fundamental one, if we have a duty to our nation."

The duty of medicine to the nation is an equally imperative one.

Are we making any attempt to grapple with this fundamental task comparable to that of the Church? Are we even considering it as a definite problem in any large way?

The establishment of hospitals in rural districts by the Milbank Fund is a private enterprise having no place in the social program of medicine itself, while the well-meant efforts of official medical organizations to "evangelize" health in the country have so far had all the defects of revivals.

Some profit may accrue by studying the methods of another profession interested and working in this field.

It is a problem worthy of our best thinkers.

Miscellany

Applied Psychology

"A wife whose husband shows any inclination to excess in alcoholic liquor has a grave responsibility. Some wives will for the sake of good fellowship aid and abet, and in this way, with the best intentions, do great harm. A puritanical horror of all liquor is at least equally harmful, if the husband uses it at all. Let her set her face steadily towards the ideal of temperance in this matter. If the husband's tendency to excess becomes well marked or grows stronger, let her examine very carefully into the question of her responsibility for it. Many a woman has forced her husband into alcoholic excess and an early grave without understanding that she has played a chief part in bringing on the tragedy. Perhaps the commonest type of such tragedy is the following: A husband racked all day and every day of the week with the cares of his business or profession looks forward to his evenings and week-ends at home as his time of compensation, and he desires at the same time to make everybody there happy, to be jolly and gay with his family. In face of a wife who is short-tempered or querulous, sarcastic, resentful, unsympathetic, without humor, who in any way chills him, he finds that the only way to be jolly is to blunt the edge of his sensibilities with alcohol. And then, of course, increasing doses become necessary, and he is in serious danger. When, in these days, a mature man gives way to alcohol, there is always some ground for it, and the ground, oftener than not, is in his domestic circumstances."—From Professor William McDougall's latest work, "Character and the Conduct of Life."

The Wrong Kind of Disease

Everybody knows that if Cleopatra's nose had been longer the course of history would have been changed. Everybody also knows that if Napoleon had not been ill at Waterloo he would have won that battle. All this is old stuff. But now comes a famous war-time surgeon of the German army to prove that it lost the Battle of the Marne because several of its generals were suffering from physical disabilities.

The Chief of the General Staff, Von Moltke, had hardening of the arteries. He was really a semi-invalid. Then there was General Von Buelow, whose arteries were also out of kilter. Another general officer had a weak heart. An important member of the Operations Staff was afflicted with gallstones. So it went. If the doctors had only sent all these military men into hospital where they belonged, Germany might have won the war.

However, it is just as well to consider the other side. Marshal Foch, it is well known, had an ailment which, while minor, was continually troublesome. But it did not interfere with his grand strategic movements. Apparently the trouble with this new German theory is that the French High Command had the right kind of diseases and the German the wrong.

After all, there seems to be something in that "fiery particle" known as the human soul which is able to rise superior to bodily limitations and to delight in labors which physics scorn.—*New York Times.*

It Seems to Me

HEYWOOD BROUN

Sooner or later physicians ought to get away from the notion that doctors may not advertise. And when this goes down, the prejudice against the doctor who writes for laymen should go with it. Naturally, I am aware that quacks and charlatans of one sort or another do advertise at the present time. It is my feeling that advertising is a wholly legitimate method for a practitioner to get in touch with the public, and I do not see why this kingdom should be left wholly to the fakers.

To be sure, very many doctors regard the making of money as a minor phase of their activity. This I say in all sincerity, though naturally I would not be willing to take a blow between the eyes for every set of tonsils snatched with imperfect warrant. But wholly aside from the question of money, there need be no great argument that a clinician needs patients. If he is skilful, the patients need him.

Merit does prevail in medicine. Not many Oslers are born to blush unseen, and yet it does seem to me that the chance for a stuffed shirt to rise to the top and stay there is greater in medicine than in any other profession. If a lawyer achieves prominence, you may be pretty sure that he is a good lawyer, no matter what his failings; but a doctor can have whiskers and an office on Park Avenue and still be no great shakes.

The ailing patient is best off when he is fortunate enough to come in contact with the medical man who is a doctor's doctor, but luck must guide the tremulous footsteps to the proper door. We of the laity must grab-bag for our healers, since their achievements are generally unsung and their abilities quite unknown to us.

Since direct advertising of any kind is an avenue closed to the reputable, the doctor in private practice must seek indirect ways to gain a following. Ask a young physician where he gets his patients and he will probably tell you that he began with friends, and from that basis went to his friends' friends, and that most of the newcomers to his office are people whom he has met around at parties.

If you are at a gathering in which any young physician is present, begin to talk about your symptoms and you will find him all attention. Inevitably he must say to himself, "This one with proper handling may be captured as a patient."

And so I do not quite understand why advertising is considered beneath the dignity of a doctor. It would seem to me a much more admirable approach than the present system of cruising about in social waters in search of salvage. The present system reduces the young physician to the level of a portrait painter.

But chiefly, I think doctors should grow up and away from the notion that it is monstrous to write of medicine for the lay public. There are subtleties in science which may be muffed by the uninitiated, but, bless you, medicine is no more complicated than painting or music, and not all the artists have been inarticulate.

There remains an unfortunate notion that medicine is masonic and that the secrets and the ritual are never to be yielded up outside the thick doors of consulting rooms. In another age the doctor was also a wizard, and while the modern practitioner would never claim magical powers, he still likes to consider himself as a sort of cross between David Belasco and an Exalted Kleagle. But people do continue as theatregoers even when they have been told how stage thunder is made, and doctors would not lose all their patients even though they ceased to use Latin in writing water into some prescription.

The business of writing on medical topics for the lay public is exceedingly complicated. The privilege is denied, or, at any rate, not freely given, to many, but here and there is one who may have full say wherever it pleases his fancy to light.

Such a one is Dr. Morris Fishbein, press agent for the A. M. A. and editor of its publications. Recently Dr. Fishbein did an article for a Sunday newspaper in which he was quite hoity-toity about psychoanalysis. I undertook to answer such aspects of the attack as were not distinctly medical, and several physicians sent me comments. Some agreed wholly with Dr. Fishbein, while others, who were themselves analysts, naturally took issue.

It seems that there were some gross and palpable inaccuracies in his article. But what impressed me most was a letter from a doctor who is internationaliy famous. He said he was glad that I had made a reply of sorts to Dr. Fishbein. He pointed out a few names and dates in which the medical editor was muddled, but he closed his letter with the caution, "Naturally, this is not for publication. It would be considered unethical for me to reply to Dr. Fishbein in a newspaper and might get me into all sorts of trouble."

And this same terror of the physicians' Pope was expressed in every other letter which dissented from Dr. Fishbein's conclusions. Merely on the issue of fair play, it seems to me unfortunate that one doctor should be allowed to attack a group in the profession and that those exposed to this fire should be forbidden to reply.

If Dr. Fishbein is to do all the talking for the doctors of America, he should be a man of broad sympathies, vast knowledge and absolute accuracy. The order is large. In a waiting room the other day I happened to pick up a slightly antiquated issue of *Hygeia*, which is a sort of tabloid got out by the A. M. A. for the women and the kiddies. There are colors and pictures, as well as statistics of mortality. To my horror, I found much in *Hygeia* which seemed to me beneath the dignity of Dr. Fishbein, who edits it. I do not think the American Medical Association, so scrupulous about quackery should allow an advertiser to state that coffee is "among the major causes of heart disease." Still less should an organ of the A. M. A. encourage the dangerous practice of diagnosis by mail. A little box at the head of the question and answer column in *Hygeia* disclaims any attempt at individual diagnosis, and yet it does slip in. For instance, a correspondent writes that his brother is "very nervous," that he "could not remember things" and was a "wanderer," and a few more vague generalizations of the same sort, to which *Hygeia* replies blithely: "The description given seems to indicate definitely that there is a mental disease present." Now diagnosis of mental disease is never easy, and even the editor of *Hygeia*, Dr. Morris Fishbein himself, is hardly competent to do it by correspondence.

Fiction in *Hygeia* (June number) consists of a merry little story of Ted Barton, who had tuberculosis and didn't know it. The doctor handles his case without letting him know the nature of his trouble, which would not seem to me the best possible propaganda to promote mutual trust between patient and physician. The story ends with a flood of rather grisly quips about tuberculosis.

This, to be sure, is merely a question of taste, but the strict scientific accuracy suitable to an A. M. A. publication should certainly restrain the ardor of a young

woman who writes a piece on "the deadly brassiere" which declares that every bottle-fed baby will turn out to be an unpatriotic American.

Still, a certain skill in the make-up of *Hygeia* is evident, because the brassiere advertisement which it carries in the same issue is almost twenty pages away.—*—The World.*

ACTION OF THE CATTARAUGUS COUNTY MEDICAL SOCIETY

Opposing Continuation of the Milbank Health Demonstration

RESOLUTION

At a meeting of the Cattaraugus County Medical Society, held on August 4th, 1927, the following resolution was passed:

"That the Cattaraugus County Medical Society go on record as desiring the withdrawal of the Milbank Demonstration from this county, and opposing any request for its continuation after the termination of this year.

"That the Society go on record as favoring and supporting a County Board of Health, conducted on a modest and practical scale and operated without interference from the State Charities Aid Association or other unofficial bodies.

"That the Society, while expressing its appreciation to the Milbank Memorial Fund for its Cattaraugus county effort, records its opinion that this experiment has demonstrated the ineptitude of lay bodies to bring about properly the transfer of the theoretical to the practical."

Report of the Society's Committee on Public Health and Public Relations

For the past four and one half years there has existed in Cattaraugus County a County Board of Health, created by the Board of Supervisors to make possible participation by the County in the Rural Health Demonstration of the Milbank Memorial Fund. The Milbank Memorial Fund, and its agent, the State Charities Aid Association, following the creation of the County Board of Health, entered into some form of agreement with the County to supply, for a period of five years, part of the funds necessary for the activities which the Board of Health would undertake. It also offered its services in the determination of the various activities, and the amounts to be expended for each activity.

The period of five years, for which this agreement runs, expires at the end of this year. Judging from correspondence received from the Milbank Memorial Fund by physicians and others in the County, it has become apparent that the Milbank Fund is quite desirous of extending the period of its demonstration in this County. Within the past two weeks the newspapers have reported an action by the City Council of Salamanca, endorsing the Demonstration and requesting its continuation. We are informed that the Executive Committee of the County Tuberculosis and Public Health Association has before it at this time a similar proposal.

As yet the Medical Society itself has not been approached, nor has its approval been solicited as an organization.

However, your Committee has considered the advisability of determining the feeling of the physicians in the County, and more particularly the members of the County Medical Society, relative to an endorsement by the Medical Society for the continuation of the Demonstration.

The essential relationship of the practicing physician to public health, and his peculiar fitness to judge its benefits, its efficiency, and its worth, make it important that his opinion in regard to the particular plan of public health work in existence in this County, be made available at this time, when a consideration is being given to its continuation and extension.

We have felt that this opinion might be of value and assistance to the officials of the County, the members of the County Board of Health, and the staff of the Milbank Memorial Fund and State Charities Aid Association.

The efficiency of questionnaires in the accumulation of frank opinions is well known. Your Committee, after mature deliberation, determined to send to each physician in the County, whether a member of the Society or not, a clear cut and concise questionnaire, dealing with the Demonstratiton. This has been done. It is for a consideration of the data so obtained, and for appropriate action thereon, that this meeting is being held tonight.

Briefly, the manner of procedure in the questionnaire was as follows:

Questionnaires were prepared containing questions with which you are already familiar. Each question was stated in such a way that the answer would be brief and definite. After the preparation of the questionnaires, 64 copies were signed and sealed by a notary. The cards sent to non-members were signed by the notary in red ink, and those sent to members, in blue-black ink. With this exception there was no mark of identification on the cards. The names and addresses of the physicians were then carefully checked by a clerk, and the 64 copies were mailed by the notary and an assistant to the 64 practicing physicians in the county.

A notation on each questionnaire stated that the psysician's signature was not necessary. This was thought advisable, in order to obtain the fullest and frankest opinion.

Of the 64 questionnaires sent out, 52 have been returned. When the questionnaires were received they were checked by the notary, and identified as the questionnaires sent out. It was necessary to send out three additional questionnaires, two physicians losing theirs, and one having made mistakes in filling his out.

Following the checking of the returned questionnaires, a summary was made by the notary, of the answers. This summary is hereby submitted:

SUMMARY OF ANSWERS TO QUESTIONNAIRE

Total number of questionnaires sent out: 64.
Total number returned: 52.
Number received from non-members (red ink): 10.
Number received from members (blue ink): 42.
Of the 52 cards received, 18 were from physicians who stated that they were local health officers.

Question No. 1: In the event that the present Health Demonstration were to consider remaining in the county for another five years, would you favor the County Medical Society endorsing and requesting such a move?
Answered "yes": non-members 2; members 10; total 12.
Answered "no": non-members 8; members 30; total 38.
Indefinite answers: 2.

Question No. 2: In the event that the Demonstration withdraws at the end of this year, would you favor the continuation of the County Board of Health?
Answered "yes": non-members 5; members 22; total 27.
Answered "no": non-members 5; members 18; total 23.
Indefinite answers: 2.

Question No. 3: Do you approve of the County Health Unit idea as developed and demonstrated in *this* county?
Answered "yes": non-members 4; members 15; total 19.
Answered "no": non-members 6; members 23; total 29.
Indefinite answers: 4.

Question No. 4: Do you favor the cooperation of lay and

unofficial bodies, such as the Milbank Fund and the State Charities Aid Association, in the official health work of this county?
Answered "yes": non-members 3; members 9; total 12.
Answered "no": non-members 7; members 32; total 39.
Indefinite answer: 1.

Question No. 5: Has the present Health Demonstration affected your practice?
Answered "none at all": 26.
Answered "favorably": 12.
Answered "adversely": 11.
Indefinite answers: 3.

Question No. 6: Do you believe that the present Demonstration is having a papuerizing effect on the people of the county?
Answered "yes": 35.
Answered "no": 14.
Indefinite answers: 3.

Question No. 7: Do you think that the present Demonstration has increased or lessened respect for the practicing physician in the county?
Answered "increased": 12.
Answered "lessened": 32.
Indefinite answers: 8.

Question No. 8: What part or parts of the work of the present Demonstration do you think have proved of most value?
Tuberculosis work 39
Laboratory 39
Venereal clinics 26
Health education and publicity 16
Sanitation 11
Nursing 11
Infancy Maternity Child Hygiene 9
Communicable disease control 4

Question No. 9: What age group are you in?
20 to 40 years: 14.
40 to 60 years: 25.
over 60 years: 12.
no answer: 1.

Question No. 10: Are you a local health officer?
Answered "yes": 18.
Answered "no": 34.

Question No. 11: Do you think that the people of the county have had "value received" for the county's expenditures in the County Board of Health?
"Answered "yes": non-members 3; members 12; total 15.
Answered "no": non-members 6; members 28; total 34.
Indefinite answers: 3.

COMMITTEE'S REPORT ON QUESTIONNAIRE

It is evident from a study of the above answers that 52 out of 64 physicians, or over 81% of the physicians, thought the questionnaire deserved consideration.

It is evident, also, that 38 physicians in this county, much more than half of the total number in the county, definitely do not want to see the present Demonstration continue. Only 12 are definitely in favor of its continuation.

In the event that the Demonstration withdraws at the end of the present year 27 physicians would like to see the County Board of Health continue, but only 19 would have it continue in the way it has been developed and demonstrated so far.

Only 12 physicians in the county record themselves as favoring the entrance of lay and unofficial bodies such as the Milbank Fund and the State Charities Aid Association into the health work of this county.

In answer to the oft repeated assertion that the Demonstration is helping the physician, 26 answer that they have experienced no such effect, and 11 report an adverse effect.

That the present Demonstration is pauperizing the public is stated definitely by 35 doctors, and it is interesting to note, in a study of the questionnaire cards, that one of the physicians recording himself as favoring the Demonstration, nevertheless reports this tendency.

It is an undisputed fact that the backbone of all effective public health endeavor is the family physician, yet 32 physicians record themselves as believing that the present Demonstration is lessening respect for the practicing physician.

A study of the answers brings out likewise the fact that these opinions are held by non-members of the Society to as great an extent as by members.

Tuberculosis work, the laboratory, and venereal disease clinics meet with much more approval from the physicians than the other branches of the work, with communicable disease control, infancy, maternity and child hygiene, and public health nursing, *as they have been conducted in this county*, meeting with very little approval. Those activities which have been successful are those which have been proved elsewhere, are not experimental, and not subject to unofficial interference.

A study of the answers, tabulated by age groups of those answering shows that opposition to the Demonstration is not confined to the older men, but is just as acute in the younger group.

To the question as to whether the county has had its money's worth, for the money the county itself has expended, 34 physicians give "no" as their opinion. The opinion of the physicians on this question is one which is of great interest, due to their peculiar and fitting position to judge. No expert, no matter how competent, and regardless of where he is from, can, in a few days study of the situation here, form an opinion as valuable as that expressed by 34 physicians who have seen the Demonstration at first hand, and clearly, for nearly five years.

RECOMMENDATIONS

Your committee is of the opinion, after a careful study of the questionnaires, and after conference with medical men in this county, that the Cattaraugus County Medical Society should go on record as opposing a continuation of the present Health Demonstration after the end of the present year. We feel that five years of the Milbank Demonstration has demonstrated little that affects this county favorably, and it is this county in which we are interested. Rather has this Demonstration demonstrated that, wherever lay bodies have attempted to interfere with and guide official health work, the result has been inefficiency and chaos. We, therefore, wish the Society to put itself on record as favoring a County Board of Health, but not the type of County Board of Health that Cattaraugus County has experienced during the last four and one half years. We wish to record ourselves as favoring separate municipal Health Departments in the two cities of the county. We wish the Society to put itself on record as favoring and pledging its support to official health workers, not guided by the whims and fads of at times inexpert lay experts. To quote the words of a writer in the July 2, 1927 issue of the Journal of the American Medical Association:

> "We have every confidence in all those specialists in public health who are legitimately specialists. We have a quite natural suspicion of those lawyers, politicians, business men, preachers, and otherwise unoccupied ladies, grouped so loosely and thoughtlessly as 'social workers' who do not have basic training or understanding of those subjects to which we have so seriously and with single hearted zeal devoted our whole preparation and life."

And further quoting the same writer:

> "We are back of every sensible measure of accredited preventive medicine. We are more than willing to play our essential part in the program of public medicine. We are not, however, a class prone to accept without due consideration the vaporings of every volunteer amateur Moses."

We wish the Society to oppose any tendency to build up in this county an expensive and unwieldly health machine. We feel that there are limits to the amount of money that can be spent with profit for public health, and limits to the numbers in personnel which a county of this size should support. We feel that the farmers of this county, whom we recognize as its backbone, should not be asked to support the large number of public health nurses which they now, through state and county taxes, are supporting. We feel that public health work, like other public works, is ruled by a law of diminishing returns, and that increasing expenditures are not necessarily followed by corresponding increasing returns.

We further feel that the County Medical Society should frown on efforts on the part of any organization to inject politics and political considerations into the public health situation in this county.

We, the members of your Committee, feel that there has been a good deal of propaganda dealing with "experts" and "expertness" which has reflected on the county, its people and its medical men.

We feel that a good public health nurse must be primarily a good general nurse, and a good public health official primarily a good practitioner. One must first have experience in the disease, before one can effectively and with cooperation practice prevention.

We resent also the continuous campaign of glorification that has been a part of the present Demonstration. We can see no more reason for such a campaign of praise of the workers of the County Board of Health than there is for similar adulation of any other officials of the county or the cities who are doing their duty, and we resent the efforts of interested persons to exploit in any way our profession.

We disapprove of premature and overenthusiastic reports in general. We resent in particular reports reflecting directly or indirectly, purposely or otherwise, on the practicing physician. We feel that the Demonstration has no monopoly on philanthropy. Physicians in this county year after year unostentaciously do a vast amount of progressive preventive medicine. They did so before the arrival of the Demonstration and they will do so after its departure.

The Physician's Library

Nasal Neurology, Headaches and Eye Disorders. By Greenfield Sluder, M.D., F.A.C.S., Clinical Professor and Director of the Department of Oto-Laryngology, Washington University School of Medicine, St. Louis. With 167 ilustrations including 2 colored plates. Pp. 428 including index. The C. V. Mosby Co., St. Louis. 1927.

This, the latest book by this eminent author, contains a short introduction by Jonathan Wright, M. D., referring to some points in minute pathological anatomy bearing on the author's thesis.

After a short general consideration of the nose anatomically and clinically Dr. Sluder discusses Vacuum Frontal Headaches with Eye Symptons Only. He believes that tenderness of the wall of the frontal sinus arises secondarily to closure of its outlet and that a similar condition obtains here to that produced in the middle ear by sudden closure of the eustachian tube. He believes that secondarily to closure of the sinus there arises a congestion of the lining membrane in which the bone takes part to a degree which, however slight, is sufficient to render the thin wall of the sinus sensitive to external pressure, even very slight pressure. The pulley of the superior oblique is attached to this wall. So for functioning of this muscle in near work there continues, more or less, a tugging at this tender point (tenderness at this point is known as Ewing's sign). This intensifies the dull ache caused by simple closure of the sinus.

There is a short chapter on Anterior Ethmoidal Nuralgia and detailed discussions of the Syndrome of Nasal Ganglion Neurosis and of Hyperplastic Sphnoiditis. This is followed by a chapter on Some Neurological Problems in Rhinology. He says the symptons which go to make up the syndrome of lower half headache can appear separately; namely, pain in forehead, eyes, upper teeth, temple, ear, occiput, neck, shoulder blade, shoulder and rarely in the arm and forearm and can be stopped by cocaine applied to the nasal ganglion district. He says these bizarre phenomena are impossible of explanation but permit of speculation.

There are chapters on the author's antrum operation and on orbital abscess. These are followed by a list of 113 case histories. The book contains excellent illustrations and also includes numerous references throughout the text, 12 pages of references in all.

C. E. Kjos.

The Normal Diet. By W. D. Sansum, M.S., M.D., F.A.C.P. 2nd edition. The C. V. Mosby Co., St. Louis. 1927.

The results of the author's researches at the Potter Metabolic Clinic of the Santa Barbara Cottage Hospital have been published in leading medical journals of the country, with particular reference to his revolutionary determinations of the significance of the food ash, and his tabulations of acid-forming and alkali-forming foods have been incorporated in the more recent editions of standard works on the subject of diet. The present volume, which is intended for lay as well as medical readers, covers all of the major aspects of dietetics in the small compass of 136 pages. The fact that the California Fruit Growers' Exchange has bought up a large edition of the book for distribution at a reduced price should not be misconstrued as the author mentions fruits in diet only to a legitimate extent, differing in this respect in no wise from standard reference works on dietetics.

International Clinics, Vol. ii. 1927, edited by W. W. Cattell, M.D., Phila., pp. 308, J. B. Lippincott Co., Phila. & London, 1927.

As usual, the International Clinics volume contains material interesting to all of us, no matter what our particular specialty or hobby might be. Those interested in diagnosis and treatment will find excellent material in L. F. Bishop's article, "A Heart-Block Clinic." An unusual surgical case is described by Christopher, while two good articles cover the public health field in its relation to students in modern preparatory schools. Foreign clinics in all branches of medicine, surgery, and obstetrics are well represented, giving a splendid résumé of the methods pursued by European authorities.

L. G. B.

Approaching Motherhood, Questions and Answers of Maternity. By George L. Brodhead, M.D., Consulting Obstetrician, Knickerbocker Hospital, New York. Third Edition, pp. 193, Paul B. Hoeber, Inc. 1927.

Innumerable books have been written on the subject of motherhood, some of which go so deeply into the scientific side of the question that morbid fears and thoughts are injected into the mother's mind. Others are of a sketchy nature and no real information is to be found in them. This book, it seems, is one of the best balanced works on the subject, listing a long series of questions that most commonly arise in the young mother's mind, and answering them in a most direct manner, with all vague theories, possibilities, and probabilities omitted.

L. G. B.

International Clinics. Edited by Henry W. Cattell, A.M., M.D. Vol. IV, Thirty-seventh Series, 1927. J. B. Lippincott Company, Philadelphia and London. 1927.

The announcement of the publishers on the jacket of this volume is to the effect that of the 36 articles comprised, 26 represent clinical lectures by teachers of 7 countries, the three Scandinavian states being well represented by 13. The so-called "Travel Clinics" make up 25 lectures delivered in 1927 before the members of the European Interstate Post-Graduate Medical Association of North America. The papers are as a rule very short and have evidently been condensed in a high degree. Perusal of them does not as a rule convey the impression of any radical new developments. In Kenneth Walker's paper on prostatic obstruction he claims that the punch gives much better results if is made to follow the local action of diathermy, which does away with troublesome hemorrhage. The article by Bing of Copenhagen on auscultation and percussion may be timely, in these days of laboratory and röntgen diagnosis for he gives a technic which requires no special talent and therefore is adapted to standardization. Schilling of Oslo contributes a timely paper on pneumoradiography of the kidney with numerous plates. The reviewer understands that this method has been tested and condemned in the United States and the author is the only one who has employed it in Norway. He prefers the teechnic of Rosenstein to that of Carelli as much more simple. From the nature of the cases reported he probably is an advocate of the method. A paper by W. Lintz of Brooklyn on high blood pressure ascribes to this condition a most deadly activity, causing more deaths than tuberculosis and cancer combined. He associates it with small lungs in many instances and from the small number of prophylactic and therapeutic suggestions is evidently a pessimist. The CLINICS continue to maintain their high rank in giving a fine cross-section of medical progress.

A Text-Book of Practical Therapeutics. By Hobart Amory Hare, B. Sc., M. D., LL. D., Professor of Therapeutics, Materia Medica, and Diagnosis in the Jefferson Medical College of Philadelphia, etc. Twentieth edition; illustrated with 158 engravings and 8 plates. Lea and Febiger, Philadelphia, 1927.

This is one of the books of one's library which may properly be labeled indispensable. That a twentieth edition of this eminently practical book has been issued is no surprise to its habitual users, who are legion. This edition carries many new excellences. Such subjects as ephedrin, isasen, pollen pastes, bismuth in syphilis, ethylene as an anesthetic, mercurochrome-220 in bacteriemia, metaphen, tryparsamide, antiscarlatinal serum and antimeasles serum are thoroughly presented. There is much new information regarding the older drugs. The arrangement of the four parts of the book is admirable. A number of distinguished experts in various branches have aided in making the work highly authoritative. The book successfully fulfills its object, which the author defines as a placing of the subject of treatment before the reader so that it may be applied at the bedside in a rational manner.

The Principles of Sanitation. By C. H. Kibbey, Director of Sanitation Tennessee Coal, Iron and Railroad Company, etc.; with 34 illustrations, including five color plates. F. A. Davis Company, Philadelphia. 1927.

This is an interesting presentation of industrial sanitation by a sanitarian who is not a physician to sanitary inspectors who "have no precise knowledge of what they are trying to accomplish" and who are appointed "without reference to, and for every other reason than because of, training and experience." The author states in his foreword that although such a one (the sanitary inspector) should understand the principles underlying health regulations goes without saying, yet "most of the literature available to him has been written by and for physicians." The book consists of a series of non-technical lectures delivered before the Sanitary Division of an Industrial Health Department where conditions necessitated an effort to place a knowledge of sanitation problems at the disposal of handicapped inspectors.

Diseases of the Skin. By Henry H. Hazen, A.M., M.D., Professor of Dermatology in the Medical Department of Georgetown University, etc. Third edition; 248 illustrations, including two color plates. C. V. Mosby Co., St. Louis, 1927.

Since the first edition of this book appeared in 1915 it has been regarded as one of our standard works on the skin, and the present edition insures the continuance of that rank. It is a general practitioner's book in size, make-up, and utility. What one has to know is there and the excessively rare diseases are not the ones featured. Anaphylactic dermatitis, radium, the x-ray, fulguration and the alpine lamp receive adequate consideration. Our old friend, eczema, disappears, and in its place are dermatophytosis, anaphylactic dermatitis, and dermatitis venenata; so modernism displaces fundamentalism even in dermatology.